Journal of the
Indian Medical Association

VOL. XIV, No. 12 CALCUTTA SEPTEMBER, 1945

TAKATA-ARA REACTION IN THE DIAGNOSIS OF HEPATIC CIRRHOSIS*

Further Observation on 111 Cases

M. NARAYAN PAI, M.B.B.S.
Department of Bacteriology, Stanley Medical College, Madras.

In a paper submitted to the Indian Science Congress held at Benares in 1941 the author described the technique of the Takata-Ara test and its value in the diagnosis of hepatic cirrhosis. The present paper is based on further observations on 111 cases from the period 28-7-40 to 7-8-1944 admitted and treated in the Government Stanley Hospital, Madras. Out of these, 54 cases were diagnosed as portal cirrhosis. The other cases, totalling 57, included cases of tuberculous peritonitis, Banti's disease, kala-azar, ascites, infantile biliary cirrhosis, anaemia, myocarditis etc. Specimens of blood serum and ascitic fluid were used for the test.

GROUP I

This consisted of 54 cases clinically diagnosed as hepatic cirrhosis. The results of the Takata-Ara reaction in these 54 cases are given in Table I.

TABLE I

Results	*Number of cases*
Strongly positive	33
Moderately positive	8
Weakly positive	9
Doubtful	1
Negative	3
Total ..	54 cases

The clinical notes of the following cases are of interest:—

Case no. 155—Kuppammal, female, Hindu, aged 42 years was admitted in July 1940 for swelling of the abdomen of six months duration. She gave a history of dysentery one year prior to admission, and of fever with rigors, lasting for two months, prior to onset of ascites (malaria ?). Fluid thrill and shifting dullness were present. The spleen was enlarged three inches below costal margin. The liver was not enlarged.

It is highly probably that this was a case of cirrhosis of the liver supervening on chronic malaria. The Takata-Ara reaction (29-7-40) was weakly positive.

Four cases diagnosed as cirrhosis of the liver gave a negative Takata-Ara reaction. Out of these, in one case, the diagnosis was very doubtful. The clinical notes are as follows:—

Case no. 163—Adisheshammal, female, Hindu, aged 25 years was admitted into hospital in September 1940 for swelling of the abdomen. The complaint started with breathlessness and swelling of the legs during her pregnancy. She delivered a premature child which lived only a few days after birth. She did not feel better after her confinement. Swelling of legs increased and gradually her abdomen became distended. *On admission* she was found very anæmic and œdema of the legs was present. There was ascites and the veins over the abdomen were slightly enlarged. The liver also was slightly enlarged, 1½ inches below the costal margin. The spleen was not palpable. There was a soft systolic murmur at the base and apex of the heart and heart sounds were rapid. An estimation of the serum proteins showed the following result:—

Blood serum albumen	..	2·099 gms %
„ globulin	..	1·183 „
„ fibrinogen	..	0·428 „
Total protein ..	..	3·710 „ %

This was most probably a case of anaemia and hypoproteinaemia (nutritional oedema) and not cirrhosis of the liver. The albumen-globulin ratio was 2:1 and the total serum protein, *viz.* 3·710% was below normal. The Takata-Ara reaction was negative.

Regarding the other 3 cases in which the reaction was negative clinical notes are not available and no conclusions can, therefore, be drawn.

Case no. 220—Hindu, female aged 30 years: a case of cirrhosis of the liver. The Takata-Ara reaction on the ascitic fluid (14-7-41) was weakly positive but the test repeated on a sample of her blood on 18-7-41 was strongly positive. The gel test of the blood serum was also positive in 10 minutes. Unfortunately it is not known whether she had suffered from kala-azar previously.

GROUP II

This consisted of 13 cases all showing evidence of liver derangement, but not diagnosed as hepatic cirrhosis. The particulars about these cases and the results of the Takata-Ara reaction are given in Table II.

TABLE II

Clinical diagnosis	*Takata-Ara Reaction*					
	Strongly positive	Moderately positive	Weakly positive	Doubtful	Negative	Total
Bantis disease ..	2	2	..	..	1	5
Cancer liver ..	..	1	..	1	..	2
Infantile biliary cirrhosis ..	..	1	1	..	..	2
Catarrhal jaundice	3	..	..	..	1	4
Total ..	5	4	1	1	2	13

*A paper read before the Indian Science Congress, Nagpur, 1945.

The clinical notes of the following cases are of special interest:—

Case no. 16—A female child of 12 years was admitted into the medical ward with enlargement of the spleen and ascites—diagnosed as Banti's disease. The Takata-ara reaction was performed on the blood of the patient on 29-8-40 and was found negative. It was repeated on 20-1-1941, *i.e.*, 5 months later and was found to be strongly positive. It is reasonable to assume that changes had occurred in the liver during this period (between August 1940 and January 1941) resulting in hepatic insufficiency.

Case no. 229—Raghavachari, Hindu, male, aged 50 years was admitted into the medical ward with a history of a swelling in the adbomen of one month's duration. The patient was jaundiced. *On examination* he was found to have a mass in the rectum. He had ascites. The case was diagnosed as one of carcinoma of the rectum and obstructive jaundice (? secondary deposits in the liver). The Takata-Ara reaction on the blood and ascitic fluid was done on 9-10-41. Both tests were moderately positive.

Group III

This consisted of 12 cases of kala-azar. In four cases the diagnosis was confirmed by liver puncture and sternal puncture and in all cases treatment with urea stibamine cured the condition and confirmed the diagnosis. The results of the Takata-Ara reaction in these 12 cases are interesting. The gel test was also done on the blood serum and the results are given in Table III.

Table III

Takata-Ara reaction		*Gel Test*	
		Positive	Negative
Strongly positive ..	10	10	..
Moderately positive ..	1	1	..
Weakly positive ..	1	1	..
	12	12	

Group IV

This group consists of cases other than hepatic cirrhosis and kala-azar. There were 32 cases in this series. The results of the Takata-Ara reaction are given in Table IV.

Table IV

Diagnosis	*Takata-Ara Reaction*					
	Strongly positive	Moderately positive	Weakly positive	Doubtful	Negative	Total
Ascites	..	..	..	..	2	2
Splenomegaly	..	..	..	..	1	1
Tuberculous peritonitis ..	1	..	..	..	5	6
Tumour abdomen	..	..	..	..	1	1
Chronic nephritis ..	1	..	..	..	..	1
Pick's disease	..	..	..	..	1	1
Obstruction: inf. vena cava ..	1	..	..	..	..	1
Enteric fever	..	..	..	..	1	1
Ankylostomiasis	..	..	..	..	1	1
Lipoidoses: Gargoylism ..	1	..	..	..	1	2
Anæmia & nutritional œdema ..	1	..	..	..	1	2
Myocarditis	..	..	..	..	2	2
No diagnosis or doubtful diagnosis	1	1	..	4	5	11
Total ..	4	3	..	4	21	32

Out of these 32 cases only 7 gave a positive reaction but it is likely that in three of these—*viz.*, obstruction to inferior vena cava, anæmia and lipoidoses, there has been liver derangement and two other cases, could not be diagnosed clinically.

Total Protein of Blood and Takata-Ara Reaction

The blood serum protein has been estimated in the following four cases. The results are given in Table V.

These results indicate that the Takata-Ara reaction is positive when the total protein in blood is over 6 per cent. When the total protein is below normal, the Takata-Ara reaction is negative though the albumin globulin ratio is altered.

The gel test and the Takata-Ara reaction—The two tests were done in 87 cases, which gave positive Takata-Ara reaction. The blood serum was used for the gel test in 74 cases and the ascitic fluid in 13 cases. Out of the former 71 cases, 17 gave a positive gel test and 57 a negative gel test. The results are given in Table VI. Cases of kala-azar are not included in this series.

Table V

Case	*Clinical diagnosis*	*Gel test*	*Takata-Ara Reaction*	*Serum alb. %*	*Serum glob. %*	*Total protein %*	*Percentage of globulin to total protein*
No. 183	Anaemia & hypoproteinaemia	not done	negative	2·099	1·183	3·710	31·8
No. 249	Kala-azar	positive ½ min.	strongly positive	2·21	7·86	10·07	78·0
No. 250	Kala-azar clinically cured	weakly positive 1 hour	moderately positive	2·77	3·63	6·4	60·0
No. 19	Cirrhosis liver	negative	negative	0·65	0·5	1·15	43·5

TABLE VI

CASES OF CIRRHOSIS OF THE LIVER AND OTHER CONDITIONS. (EXCLUDING KALA-AZAR)

Takta-Ara Reaction		*Gel Test*	
BLOOD			
Takata-Ara Reaction	Total	Positive	Negative
Strongly positive ..	44	15	29
Moderately positive ..	9	2	7
Weakly positive ..	2	0	2
Negative ..	19	0	19
Total ..	74	17	57
ASCITIC FLUID			
Strongly positive ..	9	nil	9
Moderately positive ..	3	nil	3
Weakly positive ..	1	nil	1
Total ..	13	nil	13

In a series of 600 cases, Hassan and Salah (1939) found a similarity between the two tests. The experience of the author has been to the contrary. There is no definite relationship between the two tests. It will be seen that the ascitic fluid is unsuitable for performing the gel test and all samples gave a negative gel test.

CONCLUSIONS

The Takata-Ara reaction is positive in 98 per cent of cases of hepatic cirrhosis. Kaigns (1935) found that the test was negative in other conditions except where liver insufficiency was co-existent.

In a previous communication by the author (1941) the test was shown to be positive in 92·2 per cent of cases of hepatic cirrhosis. In the present series out of 54 cases the test was positive in 50 giving a positive percentage of 92·6.

In cases of kala-azar the test was uniformly positive even in the clinically cured cases. This raises the possibility that in every case of chronic kala-azar, the liver is damaged.

SUMMARY

1. The Takata-Ara reaction has been performed in 111 cases including 54 cases of hepatic cirrhosis. Only three of these 54 cases gave a negative reaction. The test was positive in 50 cases *i.e.*, 92·6 per cent.

2. In 11 out of 13 other cases showing evidence of liver damage the test was positive. The test is therefore of value in the diagnosis of hepatic cirrhosis and hepatic insufficiency.

3. Out of 32 control cases, only 7 gave a positive result, but in three of these, there is a likelihood of liver damage and in two others there are no clinical notes available and so liver damage cannot be totally excluded.

4. There is no relationship between the Takata-Ara reaction and the gel test. Out of 87 cases which gave a positive Takata-Ara reaction, the gel test was positive in only 17 cases.

5. The Takata-Ara reaction was positive in all the 12 cases of chronic kala-azar and clinically cured kala-azar examined. It is likely that liver damage occurs in kala-azar.

6. The test is positive only when there is hyperproteinæmia. In cases of hypoproteinæmia, though the albumen globulin ratio is altered, the test is negative.

ACKNOWLEDGMENT

I am grateful to Rao Bahadur Dr. M. G. Kini, Superintendent, Government Stanley Hospital and other medical officers of the same hospital for permission to use the clinical notes of the cases and for their cooperation and assistance. I am also thankful to Rao Bahadur Dr. G. R. Dinker Rao, Principal, Stanley Medical College, Madras, for his encouragement and advice. My thanks are also due to Dr. Miss D. D. Bunyan of the Bacteriology Department, Stanley Medical College for her valuable assistance in this investigation.

REFERENCES

HASSAN A. AND SALAH—*J. Trop. Med.*, **42**:169, 1939.
PAI. M. NARAYANA—Proceedings of the Indian Science Congress, Benares, 1941.
Idem—Indian M. Gaz., **76**:361, 1941.
RAGINS, A. B.—*J. Lab. & Clin. Med.*, **20**:902, 1935.
TAKTA, M.—*Transactions 6th Congress Far East Association of Tropical Medicine*, **1**:667, 1925.
TAKATA, M. AND ARA, K.—*Ibid.*, **1**:667, 1925.

(*Continued from page 297*)

may set in, consequent on poor supply of the oxygen-nutrition. These tests do not give any useful information for moderate or slightly anæmic cases, *i.e.*, when hæmoglobin concentration is more than 50 per cent of normal.

The observations showed that plasma chlorides were retained in a good number of cases of anæmia without anasarca, the retention being more marked in cases of severe anæmia. In other words less the hæmoglobin concentration more the retention of plasma chlorides. The chlorides on an average remain normal upto 40 per cent of hæmoglobin concentration of the blood; retention was present below this figure. The highest figure for plasma chlorides in the series of cases was 780 mgm. per cent.

Pregnancy anæmias—15 cases of anæmias associated with pregnancy were included in this series. Pregnancy is said to put an extra load on the kidneys but this load is too meagre to make any alteration in the values of renal efficiency tests; this load thus seems to keep itself within limits of the reserve power of the kidneys. Ashton, Stender and Cadden have gone to the extent of saying that in pregnancy urea clearance below 80 per cent of the normal is strongly suggestive of renal damage if not associated with anæmia. Our findings confirm the same. Pregnancy had by itself no effect on the results of urea clearance test, the figures of which vary with the degree of severity of anæmia associated with pregnancy.

CHEMICAL DETERMINATION OF VITAMIN C SUFFICIENCY IN INDIA

A Comparative Study of the Different Methods

S. RAM, M.A. (CANTAB.), F.R.I.C.,
Lady Hardinge Medical College & Hospital, Delhi.

INTRODUCTION

The determination of vitamin C sufficiency or deficiency of a subject is important when treating patients with scorbutic symptoms, with gastric ulcers, pernicious anæmia, cloudiness of vision, diabetes and even with insomnia. The method is also useful in determining the adequacy regarding vitamin C of the available diet. The determination involves the estimation of ascorbic acid in urine.

The latter is carried out by the Harris-Ray technique (1935) using Tillman's reduction indicator, 2-6-dichlorphenol indophenol, as follows, the account incorporating details the writer has found helpful:

Firstly, within three days of using the indicator, the following must be done within half an hour of dissolving the ascorbic acid: (i) 0·01% watery solution of iodine, containing roughly 1% potassium iodide, is run gradually from an ordinary burette into 5 c.c. of an approximately 0·05% watery solution of ascorbic acid, in which 1 c.c. of one per cent starch solution has been added as the indicator, until the whole goes blue; from this result is to be deducted the results of a similar titration using 5 c.c. water alone in place of the ascorbic acid solution the strength of the ascorbic acid solution can be calculated: (*ii*) into 2 c.c. of an approximately 0·05% watery solution of the indicator, to which 2 c.c. of 0·2% glacial acetic acid is added, the standardized ascorbic acid is titrated from a one c.c. pipette graduated in hundredths until the red colour just disappears; from this titration one calculates the amount of ascorbic acid in mgms. to which 1 c.c. of this indicator solution is equivalent.

Secondly, the ascorbic acid in the urine is estimated by titrating the urine, or diluted urine, with ½ or 1 c.c. of the indicator solution with ½ or 1 c.c. glacial acetic acid until the red colour disappears; this titration is repeated using a volume of acetic acid approximately equal to one tenth of that of the urine used and taking exactly 2 minutes for the titration so that the reaction is complete without any other reducers in the urine taking part. From the result of the second titration the ascorbic acid in the urine is calculated.

From such estimations there are five main methods for determining the vitamin C sufficiency or deficiency of a subject.

A. SUBJECT ON NORMAL DIET

I. *The twentyfour hour excretion method* (Harris and Ray, 1935).

The ascorbic acid excreted in the total urine passed in twentyfour hours is estimated. Subjects excreting below 15 mg. show scorbutic symptoms, those between 15 and 30 mg. may or may not do so, those excreting 30 mg. or more are normal in this respect and can be considered saturated with the vitamin. If there be deficiency one may observe further how many days are required to bring the patient to normal with a test dose per day. This work may be done also after any of the other methods described below.

II. *The basic ascorburia method* (Vauthey, 1939).

On rising in the early morning the subject, fasting from after the previous evening meal until the completion of the experiment, evacuates completely the bladder, and preferably the bowels also, this urine being thrown away. Exactly one hour after, the bladder is emptied completely again, and the ascorbic acid estimated in this urine, this value being the basic ascorburia. The normal subject excretes 0·92-1·04 mg. so, an average of 1 mg., and the saturated subject 2 mg.; it is said that a test dose daily for 4 days is required to raise the ascorburia from 1 to 2 mg.

B. SUBJECT ON NORMAL DIET BEING GIVEN A TEST DOSE DAILY OF ASCORBIC ACID, OF 5 MG. PER POUND OR 10 MG. PER KILOGRAM BODY WEIGHT

III. *The 24 hour excretion after a test dose method* (Harris-Ray, 1935; Archer-Graham, 1936).

The test dose is given at the beginning of the period and the total 24 hour excretion estimated. Sufficiency is shown by the excretion of 75 per cent or more of the test dose taken.

IV. *The fifth to sixth hour method* (Abbassy-Harris, 1937; Francis-Wormall, 1942).

The test dose is given early in the morning and the ascorbic acid is estimated in the urine excreted during the 5th and 6th hours; the bladder has to be emptied at the end of the 4th and again at the end of the 6th hour. An excretion of 50 mg. or more of ascorbic acid shows sufficiency.

V. *The peak method* (Harris and Ray, 1935).

After a test dose the ascorbic acid excreted hourly for some hours is estimated. Subjects excreting 15 mg. or more in 24 hours without a test dose have a peak in their hourly excretion curve about the 5th hour after the dose.

Regarding these five as possible methods in India at present it is obvious that, firstly, when collecting the urine excreted in 24 hours some is nearly always lost along with fæces or otherwise; secondly, the estimation of ascorbic acid in the night urine will involve either the experimenter's being on duty all night or the use of considerable acetic acid to preserve the ascorbic acid and considerable hydrochloric acid and iron sulphide for the production of the hydrogen sulphide necessary to regenerate the ascorbic acid, all of the processes involved taking considerable time, and the chemicals being almost unobtainable by nonmilitary laboratories at present; thirdly; the shortage of medicinal ascorbic acid makes it inadvisable to attempt giving test doses to all subjects until proved deficient.

But before deciding from the above considerations on any one method it seemed advisable to try out all the methods on the same subject under similar conditions. This was done as follows:

Time in hours and minutes.	Item.	c.c. urine passed and collected.	mg. ascorbic acid per 100 c.c.	mg. ascorbic acid excreted.
0.00	Bowels and bladder emptied.			
1.00		16	4·52	0·72
1.15	Breakfast.			
3.00		31	7·07	2·19
5.00		36	4·71	1·70
6.15	Luncheon.			
7.00		34	4·42	1·50
9.00		45	8·61	3·88
9.45	Tea.			
11.00		52	5·93	3·08
12.00	Drank ½ lemon and water.			
13.00		52	7·07	3·68
13.15	Dinner.			
15.45	Drank ½ lemon and water.			
16.00		59	14·14	8·34
18.00		51	12·85	6·56
24.00		134	8·76	11·75
25.00		15	6·68	1·00
25.15	Breakfast.			
27.00		26	10·45	2·72
29.00		24	8·59	2·10
30.45	Luncheon.			
31.30		35	7·28	2·55
33.00		31	17·06	5·29
33.45	Tea.			
34.15	Drank ½ lemon and water.			
35.00		50	13·94	6·97
37.00		45	11·40	5·13
37.15	Dinner.			
37.45		15	10·42	1·56
40.15	Drank ½ lemon and water.			
40.45		60	17·70	10·62
45.10		139	11·92	16·57
48.00		53	7·98	4·23
49.00		20	5·35	1·07
49.5	400 mg. ascorbic acid.			
49.15	Breakfast.			
51.00		27	66·00	17·82
52.15	Dizzy and headache.			
53.00		44	94·20	41·50
53.15	Unusually hungry.			
54.15	Luncheon.			
55.00		32	104·20	33·35
57.00		37	110·00	40·70
57.25		8	47·20	3·80
57.45	Tea.			
59.00		38	43·04	16·36
59.15	Drank orange juice and water.			
61.00		50	20·81	10·41
61.15	Dinner.			
65.15		77	31·62	24·34
69.15		85	12·00	10·20
72.00		70	6·42	4·49
73.00		16	6·57	1·05
73·5	400 mg. ascorbic acid.			
73·15	Breakfast			
75.00		29	61·30	17·80
77.00		25	200·50	50·13
77.15	Unusually hungry.			
78.25	Luncheon.			
79.00		30	164·40	49·30
81.00		40	137·10	54·80
81.20		5	35·00	1·75
81.45	Tea.			
83.00		31	54·80	17·00
83.15	Drank orange juice & water.			
83.55		16	56·70	9·07
85.00		39	91·30	35·60
85.15	Dinner.			
87.15		45	137·00	61·64
89.35		70	53·03	37·17
94.10		138	22·22	30·66
96.00		46	9·90	4·55
97.00		18	10·27	1·85

Experimental

The ascorbic acid was estimated, as described above, in every specimen, night and day, of one subject's urine for four days within 15 minutes of the urine being passed. The following are the results:

Subject—Female, aged 44, height 4'-10", weight 87 lbs.

History—Said to have had rickets in early childhood and was treated accordingly; no clinical evidence of such now. Nasal polypi off and on since 1928 and sinusitis periodically since 1933; still being treated for the same. Has never bled from nose. Occasional bleeding of the gums since 1938, treated for pyorrhœa alveolaris and advised in March, 1944 to take extra vitamin C, after 6 weeks of which the gums became normal. Has never experienced vague pains in joints or muscles. Has never had gastric or urinary trouble.

General condition—Nothing abnormal well-nourished, sallow, adenoid facies, slight proptosis, very shortsighted. Gums and teeth healthy, latter irregular. Blood pressure 104/70 mm of Hg, pulse 72, Hb 80 per cent (Sahli), B.M.R. +6 (Read's formula).

Meals—Breakfast: tea, boiled milk, phulka (of whole wheat), egg, butter, marmalade. Luncheon: Cooked vegetables, phulka, mango fool (of boiled milk and boiled fruit). Tea: Salty white flour biscuits and fresh fruit (about 6 leechis). Dinner: Cooked meat, cooked vegetable, mango fool or equivalent.

Cold water had to be drunk frequently because of the weather.

Results—Experiment started at 6-45 a.m. on 13-6-44.

The hourly excretion is taken as half the two-hourly excretion and other intervals are calculated as follows:

11.45 to 3.45 p.m. on 14-6-44, *i.e.*, the 29th to 33rd hour.

11·45 to 2·15 — 2·55 mg. in 2½ hours, 0·51 mg. in ½ hour.

So in each of the periods 11.45 to 12.45 and 12.45 to 1.45 p.m. 1·02 mg. were excreted.

So excretion 1.45 to 2.45 p.m. is taken 0·51+1·76 =2·27 mg. and excretion 2.45 to 3.45 p.m.=3·52 mg.

The curves for the 4 days, 97 hours, are shown in the graph. They show that (1) when a person is on normal diet the maximum rate of excretion is at the end of the day; (2) after a test dose the maximum rate of excretion is after the 4th hour, luncheon producing a second peak in the curve; (3) after a test dose when the subject is nearing saturation, orange juice produces a second peak in the rate of excretion; this happened only when the subject, according to all standards, was normal, *i.e.*, on the second day of the test dose.

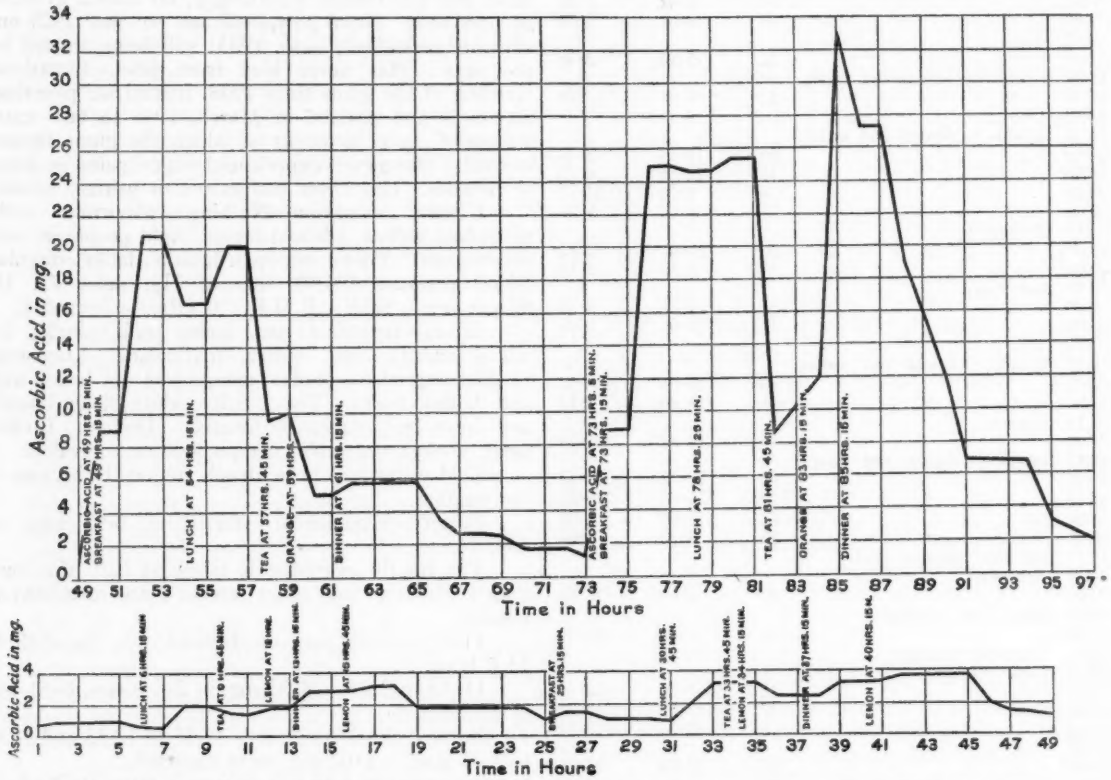
Deductions

The annexed table shows the results of the five methods and the deductions from them.

Therefore all five methods do not lead to the same conclusion even when done on the same subject at the same time under the same conditions.

Methods I and V proved the subject normal every time and with the least ascorbic acid. Method II

Period	Dose	Method I	Method II	Method III	Method IV	Method V
1st day ..	0	43·40 Normal	0·78 Subnormal			
2nd day ..	0	58·74 Normal	1·00 Normal			
3rd day ..	400 mg.		1·07 Normal	204·04 Subnormal	33·35 Subnormal	Peak Normal
4th day ..	400 mg.		1·05 Normal	370·52 Normal	49·30 Nearly Normal	Peak Normal
5th day ..			1·85 Normal			



HOURLY (ASCORBIC ACID) EXCRETION CURVES—BOTTOM CURVE WITHOUT TEST AND TOP CURVE WITH TEST DOSE

proved normality for each period except the first, the diet on the previous day not having been standardized; this seems to be a method of medium sensitivity demonstrating normality and sufficiency when the subject is not saturated. Methods III and IV required almost complete saturation of the subject according to Vauthey's basic ascorburia method. II, before they proved the subject normal, method IV being the most sensitive to non-saturation.

Because of (1) Indian subjects being accustomed to evacuate bowels and bladder in the morning before food, (2) the difficulties previously mentioned of dealing with night urines, (3) Vauthey's method requiring a medium sufficiency and Francis-Wormall's method being the most sensitive to deficiency, it seems to be advisable to apply Vauthey's basic ascorburia method first to each subject, examined either for the sake of his clinical treatment or for a determination of adequacy of the diet, and then, when the treatment be required, and when medicinal ascorbic acid be available, to give the patient the test dose daily until he reaches normality according to the Francis-Wormall 5th.-6th. hour excretion method.

When chemicals are more available it is hoped that the above results will be further confirmed by experimenting on a number of subjects believed to be normal.

Acknowledgment—Thanks are due to Dr. M. Colledge, M.D.B.S., D.G.O., D.T.M., D.M.R. for the clinical findings and to R. Chuttani, F.SC., for checking the calculations.

REFERENCES

1. ABBASSY AND OTHERS—*Lancet*, **2**:1399, 1935.
2. ARCHER AND GRAHAM—*Ibid*, **1**:710 & 1488, 1936.
3. *Idem—Ibid*, **2**:364, 1936.
4. DYKE AND OTHERS—*Ibid*., **2**:278, 1942.
5. BOULTON—*Ibid*., **2**:896, 1937.
6. PFLEGER AND SCHOLL—*Ibid*., **2**:1384, 1937.
7. MAURER—*Ibid*., **2**:1123, 1939.
8. ABBASSY AND HARRIS—*Ibid*., **2**:1429, 1937.
9. FRANCIS AND WORMALL—*Ibid*., **2**: 1942.
10. HARRISON—Chemical Methods in Clinical Medicine, 1937.
11. HARRIS AND RAY—*Lancet*, **1**:71 & 462, 1935.
12. VAUTHEY—*Ibid*., **1**:695, 1939.

OBSERVATIONS ON RENAL FUNCTION IN ANAEMIAS

N. N. GUPTA, M.D.,
Department of Pathology, King George's Medical College, Lucknow.

While working at King George's Hospital, an attempt was made to study the efficiency of kidney in different types of anaemias and establish a relationship between the two.

Seventy-one cases of anæmia of different grades of severity and different types were investigated. In each case the type and nature of anaemia was determined by the blood examination and the condition of the kidneys ascertained by the kidney efficiency tests done at different stages of the disease. No case of primary kidney was taken up for investigation. Renal function was determined by Van Slyke's urea clearance test.

DATA

Data found out after the blood tests and the blood urea determination are tabulated below.

TABLE 1—SHOWING THE RELATION BETWEEN HAEMATOLOGIC FINDINGS AND UREA

	Normal Blood Urea		*Raised Blood Urea*	
	No. of cases	Range (mgm. %)	No. of cases	Range (mgm. %)
I. R.B.C. count below 1·5 mill/c.mm. ..	10	11-34	3	64-108
II. R.B.C. count between 1·6 & 2·5 mill/c.mm. ..	29	11-38	nil	nil
III. R.B.C. count between 2·6 & 3·5 mill/c.mm. ..	18	11-38	nil	nil
IV. R.B.C. count above 3·6 mill/c.mm. ..	11	20-32	nil	nil
Total ..	68	..	3	..

The average level of plasma chlorides as compared with hæmoglobin in the blood is shown in Table 2.

TABLE 2

Haemoglobin	*Plasma Chlorides*
10— 20%	693 mgm. %
21— 30%	646 mgm. %
31— 40%	648 mgm. %
41—100%	560-620 mgm. % (*i.e.* normal range).

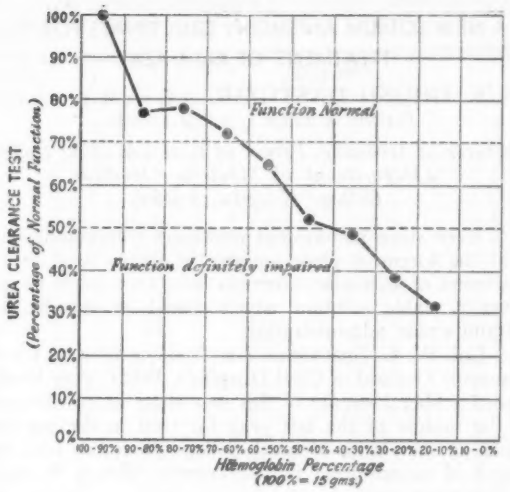
ANALYSIS

The renal function as expressed by Van Slyke's urea clearance test was found to hold a direct relationship to the severity of anaemia, being influenced more by the fall of hæmoglobin concentration than by the fall of number of red blood cells.

The renal efficiency improves in direct proportion to the restoration of hæmoglobin in blood (*vide* accompanying graph).

The renal efficiency is normal above 62 per cent of hæmoglobin (100%=15 gms. as standard).

When the hæmoglobin level reached below 34 per cent the renal efficiency was lowered to about 50 per cent of normal (Van Slyke's test). All cases possessing 29 per cent of hæmoglobin or lower, had invariably the renal function below 50 per cent of normal (range 50%-20%).



GRAPH SHOWING THE RELATIONSHIP BETWEEN THE HAEMOGLOBIN PERCENTAGE AND RENAL EFFICIENCY

The urea clearance figure as observed in cases of severe anæmia was never found to be lower than 20 per cent of the normal function.

The *blood urea* is not altered with severity of anæmia but remains within normal range except before death. Three cases of this series died and their blood urea was found to range between 64-108 mgm. per 100 c.c. of blood prior to death.

In some cases of severe anæmia rather subnormal figures were obtained (upto 11 mgm. per cent was recorded). Considering the fact that the blood urea remains normal or is even subnormal despite the low urea clearance figures, it seems that the fault lies more with the manufacture of urea in the body as compared to its excretion thus accounting for the non-use of blood urea in these cases. The cause of this may be imperfect absorption of the proteins, or less breakdown of amino-acids or low de-aminisation function of the liver tissue—all depending on the anæmic state and poor supply of oxygen to all the tissues and organs of the boby.

The leakage of *albumin in the urine* may start when hæmoglobin falls to 55-50 per cent but this is not the invariable rule. Some cases fail to show any leakage at all even for the lowest figures of hæmoglobin depending upon the capillary permeability. There were a good number of cases of severe anæmia with albumin in the urine but no anasarca, while the association of both together was equally common. This goes to show that there is a general alteration of capillary permeability in anæmia, starting with that of the kidneys. If the change is limited to the kidneys there is leakage of albumin in the urine, while a generalised change leads to anasarca.

The *specific gravity* test of urine shows lower figures in severe anæmias, so does the urea concentration test of Maclean and De Wesselow which indicate the state of tubular inefficiency or degeneration which

(*Continued at foot of Col. 2, page 293*)

A NEW SODIUM ANTIMONY GLUCONATE FOR THE TREATMENT OF KALA-AZAR

S. K. GHOSH DASTIDAR, M.B. (CAL.), M.R.C.P. (LOND. & EDIN.), D.T.M. (CAL.)

Lecturer in Medicine, Prince of Wales Medical College (Department of Medicine, Medical College Hospital, Patna)

Ever since pentavalent antimony compounds have held the foremost place among the drugs used in the treatment of kala-azar, attempts have been made to discover a stable solution which would be suitable for intramuscular administration.

Col. W. C. Spackman, F.R.C.S.ED., F.R.C.O.G., I.M.S., Inspector General of Civil Hospitals, Bihar, very kindly placed a liberal supply of this new drug at my disposal in the middle of the last year for trial in the medical wards of the Patna Medical College Hospital, with the object of determining its therapeutic efficacy in cases of kala-azar.

A sterile solution of sodium antimony gluconate (antimony v-hexonate: trade name—stibatin—Glaxo Laboratories) contains 20 mgm. of pentavalent antimony per c.c. The manufacturers claim that this preparation is suitable for intramuscular as well as for intravenous administration, and is superior to other preparations of pentavalent antimony by virtue of its stability in solution, and its constant chemical composition and antimony content. It is also stated that mice tolerate 25% more antimony when it is administered in the form of pentavalent antimony gluconate than in any other form. Compared with other pentavalent antimony preparations the rate of excretion of pentavalent antimony gluconate is also stated to be very high. In the dog, for example, 80% is said to be excreted in the first 24 hours. The extremely low toxicity claimed for this drug is also attributed partly to this property.

To date twenty one cases have been treated in my wards with this drug. The dosage followed was that suggested for "slow treatment", that is 2 c.c. on the first day, 4 c.c. on the third, and 6 c.c. on each of the subsequent alternate days till the total dosage of 60 c.c. was administered. All the injections were given intramuscularly. This route was chosen deliberately in order to determine if this drug administered intramuscularly, would be as effective as the older and better known antimony preparations which, however, have to be used intravenously.

Of the 21 Indian patients (20 males and 1 female) admitted into my wards in the Patna Medical College Hospital, on whom this line of treatment was tried, only 17 completed the full course of treatment, 2 having died of pneumonia and enteritis respectively, and 2 having absconded from the wards after 2 and 3 injections respectively. In all but four cases (Nos. 9, 11, 16 and 19) the diagnosis was made by the demonstration of *Leishmania donovani* usually in sternal puncture smears. Where a sternal puncture smear failed to show the parasite,—and in one case (No. 17) where the skin over the sternum was too unhealthy to puncture—a spleen puncture was made and the parasites were demonstrated in the smear. In case No. 16, however, no spleen puncture was made on account of the spleen enlargement being very small. The aldehyde reaction was positive in all cases, including those in which the parasite could not be demonstrated in the smears. It is of interest to note that Napier *et al* (1930) found parasitological evidence to be not more reliable than the clinical findings, for purposes of diagnosis of kala-azar.

The cases reported here were unselected, consecutive, and without complication. The results of the treatment are shown in a tabular form.

As there are no absolute criteria of cure in kala-azar it is not possible to say immediately on completion of the course of treatment, if the patient is cured. Usually the patient is kept under observation for a period extending from three to six months and if the patient is free from symptoms during that period, he is declared "cured". In the present condition of the hospital none of the above patients could be kept in the ward, for purposes of observation. In assessing the results of treatment, therefore, I relied like Napier *et al* (*loc. cit.*) on:—

(*a*) the remission of fever,
(*b*) the reduction in the size of the spleen,
(*c*) the white blood cell count,
(*d*) the gain in weight.

Fever—Of 17 patients who went through the complete course of treatment, 6 were afebrile. The other 11 had fever as indicated below:—fever for 26 days in 2, 11 to 17 days in 4, 6 to 10 days in 4, and 5 days in 1.

Spleen—In all cases the spleen was found to go down in size, the reduction ranged from ½ to 3½ inches below the costal margin.

White blood cell count—It varied from 1200 to 5200 per cmm. on admission, the average being 3500. On completion of the course of treatment the average figure rose up to 5600 per cmm.

Weight—The average weight on admission was much below par owing to the prevalent economic distress. The average increase in weight was 5·8 lb. on completion of treatment.

Discussion and Conclusion

A glance at the table will show that clinically there was a definite improvement in the general condition of the patients. As the patients did not remain in the ward after completion of treatment, it is not possible to say whether they were completely "cured." Further observations would have been necessary to establish the efficacy of stibatin as an effective anti-kala-azar remedy.

The injections were not very painful, and the pain disappeared completely after 48 hours without any local application. No untoward symptoms were noticed in any case except in Nos. 2 and 3, which developed diarrhoea lasting for about a week.

Napier (1932a) treated 254 cases of kala-azar with Bayer's neostibosan. In these, the average duration of fever, after commencement of treatment was 8 to 9 days, the average increase in weight, 5 to 6 lb., the average final white blood cell count, 7000 to 8000 per cmm., and the spleen was palpable in 64 per cent of cases. In Brahmachari's series of 28 consecutive cases, the temperature came down to normal in 14 after the first injection of ureastibamine, in 6 alter the second injection, and in 6 after the third injection.

TABLE SHOWING SUMMARY OF THE RESULTS OF TREATMENT BY A NEW SODIUM ANTIMONY GLUCONATE (CONTAINING 20 MGM. OF PENTAVALENT ANTIMONY PER C.C.

	CLINICAL DATA					TREATMENT			PROGRESS			
Serial number	Age in years	Aldehyde reaction	Smear sternal puncture	Smear spleen puncture	Duration of illness in mo.	No. of days	Vol. of drug injected in c.c.	Amount of pentavalent antimony (in gms.) administered	No. of days of fever after treatment commenced	Spleen in inches below costal margin—on admission/on discharge	Wt. in lb.—on admission/on discharge	W.B.C. count in 1000 per cmm.—on admission/on discharge
1	20	+++	− ive	+ ive	12	26	60	1·2	A	7/5	106/116	3·4/5·0
2	14	++	+ ive	..	2	18	15	0·3	A	2/-	58/-	3·9/-
3	22	+++	+ ive	..	7	27	60	1·2	M*	5/2·5	94/98	2·4/3·4
4	20	+++	+ ive	..	12	34	60	1·2	10 L	5/1·5	70/74	3·4/8·1
5	30	++	− ive	+ ive	6	26	60	1·2	L*	3/2	88/90	3·0/5·0
6	30	+++	+ ive	..	4	8	12	0·24	A	4/-	72/-	1·2/-
7	20	+	+ ive	..	2½	12	28	0·56	3 L	2/-	84/-	3·8/-
8	15	++	− ive	+ ive	3	23	48	0·96	A	5/3·5	56/64	3·0/4·0
9	18	++	− ive	− ive	2	26	60	1·2	12 L	1·5/O	84/92	4·4/6·6
10	25	+++	− ive	+ ive	8	20	60	1·2	7 L	2·5/0·5	92/94	4·6/5·4
11	25	+++	− ive	− ive	4	22	60	1·2	9 L	1·5/O	87/95	4·8/7·1
12	45	+++	− ive	+ ive	12	23	60	1·2	A	2·5/1·5	93/94	3·5/5·6
13	25	+++	+ ive	..	5	9	15	0·3	9 LH	6/-	112/-	5·2/-
14	30	+++	− ive	+ ive	24	21	60	1·2	15 M	8/6	90/98	3·2/5·6
15	40	+++	+ ive	..	18	23	60	1·2	A	3/0·5	98/98	4·8/5·1
16	14	+++	− ive	..	5	22	60	1·2	A	0·5/P	88/106	4·3/5·7
17	12	+++	..	+ ive	4	23	60	1·2	11 L	5/2	42/48	2·5/4·3
18	36	+++	+ ive	..	6	21	60	1·2	A	5/3·5	104/106	4·8/5·6
19	30	+++	− ive	− ive	4	23	60	1·2	5 M	4/2	108/98	3·8/5·8
20	30	+++	+ ive	..	2½	21	60	1·2	6 H	5/3	98/104	4·3/5·8
21	30	+++	+ ive	..	5	21	60	1·2	17 HML	3/2	90/92	4·2/7·8

N.B.—A=afebrile throughout; H=high fever; M=moderate fever; L=low fever; P=palpable; O=not palpable; *=throughout; +ive=L.D. found; −ive=L.D. not found.
Serial no. 2 died of enteritis, 13 of pneumonia and 6 & 7 absconded before completion of treatment.

The results in most cases of the present, rather short series do not compare very favourably with those obtained by Napier and by Brahmachari, using neostibosan and ureastibamine respectively.

Leishmania donovani in smears—In the series of 21 cases reported here, the aldehyde reaction was found to be positive in all. Other clinical symptoms also tallied in all cases with the diagnosis of kala-azar. Sternal puncture smears were examined in as many as 20 out of the 21 cases, but the presence of *Leishmania donovani* could be demonstrated in 10 cases only. Of the remaining 10 cases in which sternal puncture smears showed no parasites, spleen puncture smears were made and examined in 6 cases, each of which showed the presence of the parasites. That spleen puncture technique still occupies a position of importance in the diagnosis of kala-azar, is therefore obvious.

N.B.—When this report was being written, fresh directions were received from the representative of Glaxo Laboratories Ltd., to the effect that the total dosage had been changed by the manufacturers from 60 c.c. to 150-200 c.c. and that the daily dosage had been increased to 15-20 c.c. Accordingly 2 cases were given intramuscular injections in test doses of 10 c.c. of stibatin per day. As both of them developed enteritis after 3 injections, and the injections were very painful, stibatin had to be discontinued. They were subsequently given injections of ureastibamine and were soon cured.

ACKNOWLEDGMENT

In conclusion I wish to express my thanks to Rai Bahadur Dr. T. N. Banerjee, C.I.E., Professor of Medicine and Dr. B. P. Verma, Superintendent of the Patna Medical College Hospital for encouragement and giving all facilities to carry on the investigation. My thanks are also due to Professor T. N. Seth for assistance in the preparation of this article and to my successive house physicians for their co-operation and the case notes.

REFERENCES

BRAHMACHARI, U. N.—A Treatise on Kala-azar. John Bale, Sons & Danielsson, Ltd., London, p. 126-132, 1928.
MANSON-BAHR, P. H.—Manson's Tropical Diseases. Cassell and Company Ltd., London, 1940.
NAPIER, L. E.—*Indian M. Gaz.*, **56**:338, 1921.
Idem—Ibid., **58**:104, 1923.
Idem—Indian J. M. Research, **19**:705-719, 1932-1932a.
Idem—Lancet, **2**:126, 1936.
Idem—Indian M. Gaz., **74**:600, 1939.
Idem—The Principles and Practice of Tropical Medicine. Thacker Spink & Co. Ltd., Calcutta, 1943.
NAPIER, L. E., CHAUDHURI, R. N. AND RAI CHAUDHURI M. N. —*Indian M. Gaz.*, **72**:462, 1937.
NAPIER, L. E., AND SEN GUPTA, P. C.—*Ibid.*, **73**:1, 1938.
ROGERS, L., AND MEGAW, J. W. D.—Tropical Medicine, 3rd Ed. J. & A. Churchill Ltd., London, 1939.
STITT, E. R.—The Diagnosis and Treatment of Tropical Diseases, 5th Ed. H. K. Lewis & Co., London, 1929.

SULPHONAMIDE CHEMOTHERAPY FOR INTESTINAL ANTISEPSIS

S. RAJAGOPALAN, M.SC., A.I.I.SC.,
Department of Chemistry, Presidency College, Madras.

The successful application of the sulphonamides to the chemotherapy of many types of bacterial infections led, in due course, to their trial in infections of the cholera-dysentery-typhoid group. The latter, differing from those for which the sulphonamides have proved highly effective, are characterised by their main or entire localisation in the intestinal tract. Although sulphapyridine and sulphathiazole were found on clinical trial to have definite curative values in bacillary dysentery, these drugs have the disadvantage, as far as intestinal infections are concerned, of being readily absorbed from the bowels and perhaps of being renal irritants in dehydrated patients. There is no doubt that the above-named compounds would be really effective provided high concentrations could be maintained in the intestines for sufficient lengths of time. But then this achievement necessitates, owing to the drugs being readily absorbed during their passage through the gastro-intestinal tract, the simultaneous production in the blood of dangerously high concentrations of the sulphonamides which, in their turn give rise to severe toxic manifestations and render effective and sufficiently prolonged treatment of acute infections impracticable.

The pre-requisites, therefore, of a compound to be an ideal intestinal antiseptic are that it should be poorly absorbed and also possess a strong bacteriostatic and bactericidal local action. The properties of such a compound would permit the attainment of the desired high concentration in the intestines without its becoming toxic, since toxicity is the consequence of high concentrations in the blood and tissues. Sulphaguanidine, a drug which fulfills these specifications, is effective in experimental streptococcal and pneumococcal infections, is fairly water-soluble and is poorly absorbed, has been introduced by Marshall, *et al* (1940, 1941) and heralds an advance in intestinal antisepsis.

The clinical trials with sulphaguanidine have to a large extent justified the sponsors' expectations, but the degree of success achieved by the drug cannot be considered to parallel that attained by sulphanilamide or some of its heterocyclic analogues in their respective spheres of action.

The sulphanilamide derivatives of pyridine and thiazole represent two of the most powerful members of the sulphonamide group, having an inimical action on a remarkably large number of pathogenic organisms and a wide range of therapeutic usefulness. Notwithstanding the discouraging initial results with these two drugs, it is of interest to ascertain whether by suitable synthetic operations on their molecules they cannot be pressed into service in the conquest of intestinal infections. From this point of view the evolution of sulphasuxidine or succinyl sulphathiazole, and of sulphathalidine or phthalyl sulphathiazole, which is only as toxic but 2-4 times as bacteriostatic as sulphasuxidine in the intestine, is no doubt a right step in this direction (Moore and Miller, 1942; Poth, *et al.*, 1941, 1942, 1943). These N^4-substituted sulphathiazole derivatives are believed to owe their therapeutic activity to their slow cleavage to sulphathiazole in the intestine. However, the limitations of even these are apparent. The slow liberation of sulphathiazole in the intestine would ensure only a low concentration in the blood and this would be fairly rapidly conjugated and excreted through the kidneys. This is no doubt advantageous since there would not be the likelihood of production of toxic or other undesirable reactions. At the same time, this implies a correspondingly low concentration of sulphathiazole in the intestine as well and if this is the sole active agent the purpose of attaining high concentrations of a strongly bacteriostatic and bactericidal substance in the bowels would not seem to have been fully realised. It is, therefore, clear that even sulphasuxidine and sulphathalidine cannot be acknowledged to be the ideal intestinal antiseptics.

The object of transforming the highly active sulphonamido heterocycles into possible effective intestinal antiseptics appears to have been achieved now by workers at the Haffkine Institute by introducing substituents at the sulphonamide part of these molecules (Rajagopalan, 1943; Ganapathi, 1943). Chiefly by the action of alkyl or aralkyl halides or the alkyl sulphates on a few sulphonamido heterocycles, *viz.*, sulphapyridine, sulphathiazole and sulphathiazoline, a series of compounds insoluble in alkali has been obtained.

Because of the likelihood of these being not absorbed from the intestines, which is alkaline in pH, the type of compounds synthesised are expected to prove particularly useful in infections of the intestinal tract. Actual evaluation of these compounds as to their efficacy as intestinal antiseptics, which is now probably in progress, would be awaited with interest.

At the present time the solution of the problem of bacillary dysentery is far from complete. The evolution of the ideal intestinal antiseptic still awaits achievement by chemistry in close collaboration with medicine. In recent times, the spirit of endeavour to rationalise the practice of bacterial chemotherapy has, however, been spreading. It is, therefore, to be hoped that the design of future chemotherapeuticals for intestinal antisepsis will necessarily take into consideration the knowledge increasingly made available by modern bacteriological studies concerning the "growth-factors" and "accessory growth-factors" involved in the metabolism of pathogenic organisms infecting the human intestinal tract.

REFERENCES

GANAPATHI—*Proc. Indian Acad. Sci.*, **18**:355, 1943.
MARSHALL, *et al*—*Bull. Johns Hopkins Hosp.*, **67**:94 & 163, 1940.
MOORE AND MILLER—*J. Am. Chem. Soc.*, **64**: 1572, 1942.
POTH, *et al*—*Proc. Soc. Exp. Biol. Med.*, **48**:129, 1941.
Idem—*Arch. Surg.*, 44:187-208, 1942.
Idem—*J. A. M. A.*, **120**:265, 1942.
Idem—*Am. Soc. Pharmacol. Federation Proc., Baltimore*, **2**:89, 1943.
RAJAGOPALAN—*Proc. Indian Acad. Sci.*, **18**:104, 1943.

WHOLE BLOOD THERAPY : ITS PAST AND PRESENT

M. ABDUL HAMEED, M.D., M.R.C.P. (LOND.)

Professor of Pathology, K. G. Medical College, Lucknow.

Whole blood therapy indicates transfusion of the whole blood from one person into another. It is used mostly, either in the treatment of shock after operations, accidents, and hæmorrhages or in certain disturbances of the hæmopoietic system. Many accidents in blood transfusion have happened either due to a faulty technique or as a result of ignorance about certain important points regarding blood groups. An attempt is made in this paper to describe the past and present position of the blood groups, and thus help those who still feel diffident to do a blood transfusion at a time when it is badly needed.

Historical

Blood has been used as a therapeutic agent from time immemorial. It was once used for the massaging of the body among the ancient. It has been said that even Pharoes of Egypt used to have bath in the blood collected from their slaves and enemies. Blood in many cases was also used as a drink to restore health, and this practice among the ancient can be justified even now on the scientific grounds because haemoglobin and its derivatives are being used intensively in the treatment of the different types of anaemia.

The history of blood transfusion is full of all kinds of stories. It is said that Naam, the King of Syria, was cured of his illness by the partial removal of blood from his body and its replacement by that from healthy persons. Some writers have stated that the first transfusion of blood was done on Pope Innocent VIII in 1492 by his Jewish physician—the blood being collected by bleeding three boys to death. This statement is probably a legend because circulation of blood was enunciated by Harvey in 1628, and hence the idea of successfully transferring blood from one person to another could not have been achieved in 1492. After the discovery of circulation by Harvey in 1661, Richard Lower in England transfused blood from one animal to the other by directly connecting the artery to the vein. In about 1665 Denys, physician to King Louis XIV of France, practised the art of transfusion of blood from one person to another and made this therapeutic measure popular, both in England and France. But soon the fame of Denys came to an end because most of his patients after the transfusion, passed urine "as black as soot" and died. Denys was then publicly tried for the malpractices in the art of medicine and his trial was given great publicity both in England and France and blood transfusion declared an unlawful act by the law of the land in both countries. After this event nobody thought of opening this chapter of history of medicine for 250 years.

When Landsteiner in 1900 found out two agglutinogens in the human red cells and the two corresponding agglutinins in the serum, he attributed the failure of Denys to the incompatibilities arising from the agglutination of red blood cells by the iso-agglutinins. On this important discovery he was awarded the Nobel Prize. Further in 1907, Ianski and Moss divided the human race in four Blood Groups and named them, I, II, III, IV in their own fashion. This numerical grouping did not carry any meaning to the scientific mind and hence the groups were named under the International nomenclature as AB, A, B & O, because Landsteiner himself called these agglutinogens as A & B and iso-agglutinins as a & b. Among these four groups 'O' group was known as universal donor and 'AB' as universal recipient.

The distribution of these groups in England, as given by Maskey, is as follows:—

Group	AB	3%
,,	A	44%
,,	B	10%
,,	O	43%

Our own figures based on the grouping of 1100 Indians show:—

Group	AB	6%
,,	A	27%
,,	B	36%
,,	O	31%

Thus we see that as we go from west towards east incidence of Group A decreases and Group B increases.

Other Agglutinogen and Agglutinin

The absorption methods have shown that Group A can be further subdivided into Groups A_1 & A_2 with their corresponding agglutinins. The sub-groups of Group A are not ordinarily taken into account when matching of blood is done for blood transfusion, but they do play a certain part in the inheritance of agglutinogen by the child from its parents.

In 1928 Landsteiner and Levina further found out two new agglutinogens M & N in human blood cells and thus three more blood types were determined *viz.*, Type M, Type N, Type MN. These agglutinogens are peculiar in the following respects:—

1. They have got no corresponding agglutinins.
2. They are always present at birth.
3. Their absence has not yet been reported from any individual.

As they have got no corresponding agglutinins, they do not interfere in the transfusion of blood. Their distribution in the European population is: M=30%, N=20%, and MN=50%.

In 1940 Landsteiner and Wiener prepared an anti-Rhesus serum by injecting washed red blood cells of Rhesus monkey into rabbit and while testing this anti-Rhesus serum with red blood cells of human beings they found out that red blood cells of 85% of the individuals were agglutinated with this anti-serum while 15% were negative. Red blood cells of those who were positive, were supposed to contain a Rh antigen and were called Rh positive, and similarly the negative cases were called Rh negative.

Inheritance of Groups

All the agglutinogens present in human red cells follow Mendelian law of heredity. Among the blood

groups agglutinogen A & B have got dominant character and among the blood types M & N and also Rh factors behave like dominant characters. The recessive characters are shown by 'O' Group and Rh negative individuals. Mendelian law is best manifested in those cases which are homozygos *i.e.*, genis for the same kind of agglutinogen is carried by both the chromosomes.

It is not possible for me to describe all the laws of inheritance which have been evolved due to different experiments, but this can be said that the above mentioned blood antigens have helped in establishing the disputed parentage of child in a certain number of cases. Some of the human beings can even secrete water-soluble agglutinogens A & B in their secretions like saliva, semen and other body fluids. They are called 'secreters. Hence the human beings have been divided into "secreters" and "non-secreters" according to Schiff. The secreter-property is also inherited as a Mendelian dominant. Secreters, of course, are detected in the criminal cases from the mark of secretion or excretions left on their garments or on postage stamps or cigarette stumps. Although these agglutinogens are inherited by child, agglutinins are never inherited. So every child has to manufacture its own agglutinins. Most of the new born (50%) possess mothers' iso-agglutinins at birth but after a week or so mothers' agglutinins diminish from their body and they manufacture their own. This is to be remembered that it is not a general rule that every child shall have mothers' agglutinins at birth and hence transfusion of mother's blood to her own child should not be undertaken with impunity.

Sources of Error in Matching of Blood

It is needless to describe the technique of blood grouping but it will be worthwhile to mention some possible sources of error.

(1) Red blood cells suspension should be made with 2% Sodium Chloride Sol. in a dilution of 1:20. Dilution of blood and the increase of the strength of saline from 0·85 to 2% is supposed to intensify the reaction of agglutination through the enhanced action of the electrolyte contained in the saline.

(2) Rouleaux formation can be avoided by diluting the serum of the recipient to ½ or ⅓. It is mostly seen in the direct matching when donors' red cells are matched with the serum of a recipient whose blood sedimentation rate has been high.

(3) Universal donors are sometimes dangerous because the titre of their agglutinins may be so high as to agglutinate the red cells of recipient even on getting diluted in his blood. So it is essential to find out the agglutinin titre of the serum of the blood of a universal donor and if it is more than 1/30 he should be rejected as a donor for groups other than his own. Similarly, in the case of a universal recipient the incompatibility may arise if the titre of the agglutinins of the donor's serum is high. It is a good rule that in blood transfusions blood of the same group should be given as far as possible while universal donors should be kept for emergencies only, on such occasions blood should be given very slowly in order to give enough time to donors' agglutinins to get diluted otherwise there may be a risk of incompatibility. Transfusion of course, in such cases should be stopped as soon as any untoward symptoms appear. In order to find out whether the donor or the recipient belongs to the same group, cross matching of blood from both should be done and it should not produce any agglutination.

Indications

It is needless for me to go into the commonplace indications of blood transfusion but I will like to emphasise upon the observation that blood transfusions have been found also to reduce the coagulation time of blood although temporarily; therefore, it can be used for the treatment of hæmophilia and purpura and other hæmorrhagic conditions of the newly born and the adult. The transfusion of blood serum has also been tried in cases of hydræmic nephritis in order to increase the protein content of the blood and thus to get rid of œdema by increasing the colloidal osmotic pressure of blood in the arterioles.

Dangers

1. The dangers which are sometimes met during or after blood transfusion are mostly due to some error in grouping or direct matching of blood of the donor with that of the recipient. The symptoms exhibited on such an occassion are tingling sensation all over the body with precordial oppression followed by cyanosis and dyspnœa. Sometimes there is a chill followed by a rise of temperature to 103° or more, with hæmoglobinuria and urticarial rash accompanied with pain in the lumbar region. In some cases patient may become unconscious or delirious and death may ensue. It has been observed that if not more than 100 c.c. of incompatible blood has been given to the patient, he usually recovers and if the full amount of 500 c.c. is given, death usually follows in a few hours.

2. It has sometimes been observed that a recipient who had received transfusion from a donor and showed no reaction on the first or second occasion might show a severe reaction on the subsequent one, if he had received blood from the same donor. Such an event is explained by assuming that the donor's blood contains an extra antigen—Rh, while recipient had none like that. Hence the introduction of Rh antigen into the recipient behaved like a foreign protein giving rise to anti-Rh bodies which had given rise to the severe reaction on the third occasion of transfusion by combining with antigen Rh.

Advantage has also been taken of this discovery in explaining certain types of hæmolytic anæmias found in the new born. It has already been pointed out that this Rh factor follows Mendelian law as a dominant factor in heredity. Hence if husband is Rh positive and wife is Rh negative, the chances are that the child will also be Rh positive. In such cases when child is Rh positive and mother is Rh negative, this Rh antigen in the cells of the fœtus will act as a foreign protein if it enters the blood of the mother accidentally through placental connections. As a result of this, the mother will develop anti-Rh serum. This serum when

it reaches the fœtus, probably hæmolyses the red blood cells to a certain extent or disturbs the normal hæmopoiesis of the fœtus in a manner that the nucleated red blood cells persist after delivery. This gives rise to the persistence of extramedullary hæmopoietic foci, after birth. Clinically the condition manifests itself in the child as *(i)* Icterus gravis neonatorum, *(ii)* as generalised œdema of the body known as hydrops fœtalis and *(iii)* Erythroblastosis fœtalis. The above conditions are usually associated with a peculiar, bright, golden-yellow vernix caseosa and severe anæmia with a large number of nucleated red blood cells of all sizes in the peripheral blood. The condition is familial and congenital. Sometimes the first child escapes from the disease and only the subsequent ones get it. Treatment for such an anæmia in a newly born is to transfuse the blood of a universal donor who is Rh negative into the child, and this may help in establishing the normal hæmopoiesis in the child. Probably on the same observations different grades of jaundice present in the newly born *e.g.*, icterus neonatorum etc. may be easily explained.

3. Citrate reactions have been talked of very much. Sodium citrate was blamed for reaction which is manifested by chill followed by rise of temperature with nausea and vomiting. Some workers have found out that sodium citrate make the red cells more fragile and diminish the immunity reactions in the recipient, while other workers have contradicted these observations. On the whole, clinical experience shows that the reactions which follow indirect transfusion of citrated blood are not due to presence of 3% sodium citrate in a dilution of 1 in 5 of blood, but are due to the distilled water containing pyrogen bodies. Therefore, if pyrogen-free water is used and rubber tubings and glasswares are so well cleaned that no trace of whole blood remains, then such reactions can be avoided. In order to avoid such complications completely Per-Hedenius introduced a method of transfusing whole blood directly from one individual to another by introducing heparin in the blood of the donor, and thus increasing his coagulation time. The actual transfusion in this way can be done with a 50 c.c. syringe after collection of the blood from the donor in a sterilized vessel.

4. It is quite possible that in case of whole-blood transfusions, diseases like syphilis, malaria and measles might get communicated to the recipient if these diseases were not excluded from the donor before giving blood transfusion. How far syphilis in its tertiary and subsequent stages can be thus transmitted to the recipient, is a debatable question.

Summary and Conclusion

1. The past and present position of the blood groups have been described.

2. The percentage figures of different blood groups among Indians has also been mentioned.

3. Likely sources of errors in blood transfusion have been fully death with.

TUBERCULOSIS—A DISEASE OF SOCIETY

H. G. D. MATHUR, B.SC., M.B., D.T.M. & H., M.R.C.P.(E.), DR.P.H.

Professor of State Medicine, Lucknow University
and
Medical Officer, Provincial Hygiene Institute, Lucknow.

The incidence of the infection, whether of lungs or of other parts of the body, shows a very marked increase when one examines the statistics of the cases treated in Hospitals and dispensaries. There is no doubt that an appreciable amount of this increase is due to greater facility for treatment provided by the increased number of institutions, and thus attracting more patients and to the better facilities for a correct diagnosis but there can be no doubt that tuberculosis, ever since the last world war, has been exhibiting a definite and absolute increase in its incidence, and I am sure all of you present here who have been in practice since 1914 have noticed the same tendency. The current war much longer than the last one, and with a much greater stress and strain on even the civilian population, is bound to lead to an increase in incidence unprecedented in the history of this disease in this country. No apology is therefore necessary for bringing before you the subject of this disease.

In a note that I presented at the Nagpur Session of the All-India Medical Conference in 1935 and which was printed in the Journal of the Association in August following, I had taken the liberty of representing tuberculosis not as a disease of the individual but as a symptom of a serious pathological change in the socio-economic fabric of the family. Keeping up the same standpoint I shall present a few more facts about the condition. Vicious circles in causation of disease in the individual have been described. But from the point of view of the family ecoomics, the disease presents even a greater number of vicious circles, which, acting simultaneously, carry the family inexorably to a veritable whirlpool. Caught up in this whirpool of ruinous expenditure the family is soon sucked down to the deepest level of bankruptcy both monetary as well as physical. It is the duty of society that as a defensive measure against such disasters overtaking its constituent families it should put forward some measures to protect them and thereby protect itself.

The Role of Society—Society incurs quite an amount of expenditure to protect itself against injury from criminals by removing them from its midst and meets all the expenses of keeping them in prison houses, similarly it must be a legitimate and necessary charge on the society's finances, that it should have hospitals for all the tubercular patients, not from any such pious impulses as charity or humanitarianism, but from the more matter-of-fact principle of protecting itself from serious injury from these patients. In almost all except the highest levels of society an appreciable reduction in the cost of treatment to the patient individually would be a great help in his tiding over the financial difficulty. This could be achieved by subventions to hospital and sanatoria from public funds under the head "public safety". This would be analogous to the expenditure on fire fighting and traffic control. Most

SOCIO-ECONOMIC WHIRLPOOL OF TUBERCULOSIS

hospitals and almost all dispensaries lack in funds to meet fully the needs of cases of tuberculosis. Give the tubercular family a chance not charity.

In addition to the hospital accommodation for the intractable cases of tuberculosis, there should also be some provision for tuberculosis colonies for the cases with "disease arrested". These colonies by providing a suitable healthy environment for the living and work, and with facilities for medical aid and supervision, are able to arrange on co-operative lines for the sale of articles manufactured in cottage industries by the patients at rates much more favourable than what would be available to the patients working by themselves. This to a very great extent relieves the economic pressure on the family. Much of the work will be in the nature of charitable work, but when this charity is doled out to the patient or their families, as such, it seems to present to the recipient some objectionable and unacceptable features. This unpalatable medicine of charity so very necessary for the family can be made

less bitter and more desirable by being sugarcoated in the shape of sanatoria, infirmaries and colonies. Charity is the esential component of the life-buoy which has to be thrown out to succour the infected family from being carried away to the whirlpool of tuberculosis and being sucked down to its own utter annihilation.

The Role of Industry in Spread and Control of Tuberculosis—Industrial development in all countries has led to an increase in incidence of the disease in the past but it does not appear that we are inclined to benefit much in this country from that experience. The massive and uncontrolled urbanisation of rural populations in areas which have not been especially designed for the purpose, leads to a lage scale creation of slums. The information, culled from the report of 1931 census when the housing conditions were studied for the city of Cawnpore shows a very unsatisfactory state of affairs. The recent unprecedented increase in the population of this city without a proportionate increase in housing and other civic amenities, have led to an even greater aggravation of the slum problem, which are the hot beds of disease in general and tuberculosis in particular.

The high cost of housing and of living generally in the city militates against the factory worker living with his family. The simultaneous absence of healthy recreational facilities leads to alcoholism, prostitution and venereal disease. Close in their train follows tuberculosis. The labourer tries to rally under the massive onslaught but many a man goes under, loses his job and drifts back to his rural home to linger on, spreading the disease in his family circle for a long time before dying.

Just as we object to the industry polluting our atmosphere by smoke and of our streams by their untreated drainage, we should also object, and even more vehemently, to their thus polluting the salubrious rural areas by tubercular infection. There should be a vigorous protest from the medical profession in this connection.

It must however be remembered that the industry itself stands to benefit if it arranges for better housing, for experience in factory administration in the West has shown that expenditure on this item pays a good dividend by a greater output of work by a contented and unworried worker. Moreover, there is much less of loss through decreased output, absenteeism, and frequent turn over of labour, with consequent less frequent training periods for new hands.

Our Educational Institutions—In schools one finds many students who are to some extent eking out their parents' poor contribution for their expenses by engaging in private tuition or other part-time work. Most of these, on account of overwork, lack of rest and healthy recreation and even of inadequate nourishment are poor in physique. Added to this the constant worry and anxiety seriously interfere with the development of a sound and balanced personality and they are usually not capable of acheiving as great a success in after life as the more fortunately placed colleagues can be and almost all of them drift into the teaching profession, with its hard work, low renumeration but the necessity of maintaining the show of a respectabe standard of life. Many of them as a result develop active tuberculosis and in their turn are responsible for passing the infection on to the children entrusted to their care. That is how an unimaginative society loses seriously through the inroads of the disease amongst its rising generation. It is moot question whether the school master developed the disease as a result of poor pay or whether it was the absence of the full "fight" in him for the physically more arduous jobs which made him accept the poorly paid teaching profession; almost as moot a question as the proverbial one of the hen or the egg to be first to come in existence. But has the society any justification for continuing the vicious system.

In all clerical establishments the same phenomena of low pay but hard work is seen but society is unperturbed in its ruthlessness.

The duty of the general practitioner in the control of tuberculosis can be a very important one if he has in mind the good of his community. I would ask them to ponder over these pieces of advice.

1. Be ever on the alert to watch for the Enemy. It works its way so insidiously that unless you are wide awake and ever ready to make the best use of your own technical and clinical skill as well as the aids to diagnosis provided by the laboratory and skiagraphy, you are liable to be let down rather badly. Many cases are labelled as chronic malaria, typhoid or dyspepsia which are really those of tuberculosis. Even if you suspect the enemy do not hesitate to warn the patient. Many physicians are unfortunately too hesitant to give the correct diagnosis; their idea of giving the patients the benefit of doubt is wrong. A clear-cut diagnosis very often is too late for recovery.

2. Moreover many practitioners do not definitely specify the care that the patient should take to prevent others in the family from getting infected. All the contacts should invariably be thoroughly examined from time to time—particularly the children who are the most susceptible to infection where the mother is infected.

3. (*a*) A practitioner should try to isolate the patient even in his home. In Vienna, the expedient of partitioning off by fixed screens a portion of the room for the exclusive use of patient was tried out successfully and with benefit in the case of one-room families.

(*b*) Detailed instructions regarding the adequate collection and disinfection and appropriate disposal of sputum are very necessary. They are but rarely given.

(*c*) The risks from droplet infection, in coughing or sneezing are hardly ever realized and never appropriately emphasized on the patient.

4. All practitioners should be fully conversant with the facilities that may be aavailable, or could be made available for his patients. He should ever be on the look out for those fortunately placed members of the community who can succour the tubercular family and advise them as to the best means of doing so. Control of tuberculosis should be the first item for consideration whenever any funds are available for charities. A general practitioner by being able to make

(*Continued at foot of col. 1, page 309*)

PROBLEMS OF FILARIASIS WITH REFERENCE TO POST-WAR PLANNING IN INDIA

N. AHMAD, F.R.F.P.S. (GLAS.), L.M. (DUB.), M.B.B.S. (BOM.).

Divisional Medical Officer, Dinapore, E.I.Ry.

Malaria and filaria are the two mosquito-borne diseases in India, the devastations of which are worse than those of any plague that inflicts human beings anywhere in the world. Malaria kills while filaria maims. Malaria is admittedly our Public Enemy No. 1 in India yet we can cure malaria if we cannot prevent it but we have no specific to cure filaria if we fail to ward off its infection. Filaria causes such untold misery and unhappiness, specially in the sexual life of the young and vigorous males of an infected community, that malaria recedes into the background and filaria takes the first place in the endemic regions. Filaria acts like a hidden axe that silently cuts at the root of human health, happiness and fertility in the areas where it is endemic. It produces anaphylactoid symptoms in the very young, troublesome illnesses in youths, genital blockages in adults, deformities and mutilations in grown ups and fatal inflammations in the old. We have anti-malaria schemes to prevent and quinine and its substitutes to cure malaria but with the exceptions of individual efforts here and there and a research department at the School of Tropical Medicine, Calcutta, which is doing useful work, the State and its organized bodies like public health departments, municipalities, district boards, are doing practically nothing to fight this scourge. Its destructive process is, somehow so slow and unspectacular that it has failed to create that intense interest in the public and the profession which urges a people to take up arms to fight against a public menace in right earnest.

These are the days of post-war planning and it is our duty to point out to the people concerned that no post-war planning would be of much use and benefit to the people living in endemic areas if it fails to provide workable anti-filarial schemes for efficient prevention, and adequate research work to find a specific for eradicating filaria in the early stages and to perfect medical methods and surgical technique for efficiently dealing with its manifestations in the late stages.

Filaria is all problems. Its infection, disease, diagnosis, prevention and treatment all present problems that beg solution. I shall endeavour to mention here only those important problems of filariasis which could be of interest and help to post-war planners as well as medical workers and practitioners in general.

Problems of Filarial Infection

It may be noted that unlike all other infections filariasis has the following three unusual features:—

(1) Filarial infection does not necessarily mean filarial disease,

(2) Spread of infection is possible only if there is mass infecting material, mass infection and mass transmission,

(3) Mere reduction of endemicity-rate does not help matters but makes the infection clinically worse.

It is found that 6 to 10 per cent of healthy individuals in endemic areas in India and upto 30 per cent in other places harbour microfilaria in their blood and may show no filarial disease whatsoever at any time in their life. They are "non-susceptibles" of Acton and Rao and may be taken as potential "carriers". They are a problem to an epidemiologist as their presence necessitates examination of each and every individual living in an endemic area to make a correct survey of the rate of infectivity and they are a despair of people undertaking preventive work for it is hard to induce healthy persons to submit to the bother and inconvenience of undergoing periodical courses of treatment in order to save others from possible infection. They also put a clinician into a fix if they begin to show signs of anaphylactoid reactions such as slow fever, muscle and joint pains, migraine, periodical headaches, troublesome attacks of urticaria or eosinophilia in blood which may be due to helminthic toxins of filarial origin or to some other disease of known or unknown ætiology.

As to the question of the spread of infection we know that it fortunately cannot take place through sporadic cases. For infection to spread from man to man, millions of microfilaria must exist in the peripheral blood of a man and a swarm of mosquitoes should bite him and survive afterwards to act as secondary hosts and a good number of them should bite a healthy man at various occasions to infect him. These conditions of mass-infection and mass-transmission for the spread of filariasis while responsible for keeping the areas of endemicity strictly limited to infected regions, point out to us that mass movements of infected persons to vulnerable areas such as occur at our large 'melas' when people go and live at the places of pilgrimage along sea-coasts and large rivers, in crowded and insanitary conditions, for 10 to 30 days or military movements and campaigns or industrial congregations could turn the healthy areas to endemic ones. Francis reports that such a thing actually occurred in America where Charleston, a healthy place, became an endemic area through a ship-load of negroes imported as slave labour from a heavily infected place in Africa.

Problems of Filarial Disease

The problem whether the clinical manifestations of filariasis are due directly to filaria or indirectly to superimposed infection still begs solution. It is believed that filaria produces helminthic toxin which gives eosinophilia and other anaphylactoid symptoms and also produces epi- and meso-blastic 'kataphylaxis' which prepares a nidus for exo- and endogenous infections which clinically produce filarial disease (Acton and Rao) ; but there are others who believe that 'infection theory' is not necessary to explain its usual manifestations. Even the initial bouts of fever are supposed to be due to secondary infection by same and to filarial toxin by others. Then out of the two varieties of filaria responsible for filariasis in India, M. Malayi is supposed to give only elephantiasis and no other trouble while W. Bancrofti gives all varieties of lesions. Bancrofti infection takes place through culex fatigans and is urban in distribution and the site of its initial entry is generally lower limb. In cases of heavy

infection the femoral glands get blocked and elephantiasis of the lower limb results but when the concentration is not so heavy, the blockage occurs in inguinal glands and the lymph from the limb is diverted to the scrotum giving scrotal lesions. In cases of very low infection the worm could pass higher up and block preaortic and other abdominal glands and the worm then takes the line of the least resistance and migrates downward *via* the testicular lymphatics and blocks the internal genital vessels and produces hydrocele and the lesions of the cords and its coverings or the trouble may remain confined to abdominal glands and cause recurrent colics and may even simulate appendicitis or inflammatory type of acute abdomen and create quite a problem in diagnosis and treatment of the actual condition. The relation of endemicity rates of Bancrofti to its clinical manifestations is of interest and importance to us:—

(1) Endemicity rate of higher than 20 per cent means elephantiasis,

(2) 20 per cent to 10 per cent means genital and other lesions,

(3) Below 10 per cent means only chyluria and lymphatic involvements.

Why this occurs has been explained by the intensity, sites and levels of the lymphatic blockage by the worms at different endemicity rates in the case of Bancrofti but why should M. Malayi give only elephantiasis at all endemicity rates and not give genital and other manifestations, as in usual with Bancrofti, is still a problem to us and we have had no insight into the working of M. Malayi at all. The tragedy of the whole situation lies in the fact that Bancrofti is the commonest vector in India and with the partial improvements in sanitary conditions of the towns in our endemic areas the high endemicity-rate decreases making the genital lesions the commonest feature which is particularly unfortunate as it affects the potency of male population at just the age—15 to 225 years—when it is at its period of highest activity. Exact statistics for endemic regions in India are not yet worked out but in other places it has been found that in certain islands about half of the men are impotent due to genital filariasis.

The problems that confront us for solution in the case of filarial diseases therefore are:—

1. What conditions produce clinical manifestations in an infected case?

2. Is the presence of filaria in the system enough to initiate the disease process or secondary infection is essential to start the mischief?

3. What determine a particular type of lesion and if it is the rate of endemicity that does it why is it not true in the case of M. Malayi in India?

4. Are there any other varieties of filaria such as Loa loa in addition to the two known W. Bancrofti and M. Malayi, which may cause filarial diseases in India and if yes, what are their pathogenic actions and areas of endemicity?

Problems of Filarial Diagnosis

Malaria could simulate any known disease and baffle an uninitiated but filaria producing lesions in internal regions like thorax and abdomen could outwit the acutest diagnostician specially in localities where only sporadic cases are met with. Some cases of filarial disease are very rare and some though known to the profession are very uncommon in India while others are simply baffling. I shall briefly describe the problems of these groups under separate heads.

Rare cases—Cooper of Bombay described a case if filariasis of scalp—a rare site indeed. Rishworth of G. I. P. Railway had a case of a lady complaining of wriggling sensation under the skin of the side of her neck. She was watched till a localized swelling was noticed which was ingeniously excised and a worm of uncommon variety was removed intact. Duggon of Bombay removed a worm from under the conjunctiva of the same lady. Filaria under conjunctiva and other rare sites has been reported by other workers as well but their detection is often accidental. Filaria that habitually wriggles in subcutaneous tissue or found under conjunctiva and in dermal swellings is generally of Loa type which has not yet been known to exist in India and we have to solve the problem of the true identity of the worm in such cases.

Well-known but uncommon cases—Filariasis of the female breast and external genitalia is well-known but not very common in India. I have dealt with all sorts of filarial cases extensively in Bihar for the last 15 years but somehow have not come across a single case of filarial labia or breast. In moderately endemic areas genital manifestations are the commonest but it appears that, in the female, the worms find that migration from the regions of pre- and juxta-aortic glands is not the line of least resistance and I believe they remain confined to abdominal lymphatics and glands and give vague and unexplained type of trouble in the female pelvis and abdomen. Then the common site of entry of Bancrofti is lower limb which may explain why filariasis of the female breast is so very rare in India. However, the problem of the departure from the usual of Bancrofti in the case of females, is there and its solution may give an insight into the ways of its migration to various lymphatics.

Baffling cases—The profession is not very familiar with the cases of filariasis of the thoracic and abdominal cavities and the practitioners working in the tropics and even those who practise in endemic areas are likely to miss them altogether. I do not know whether such cases have ever been recorded in detail but I have had a few cases of thoracic and quite a number of abdominal filariasis which I have discussed in a separate paper. I know that filaria can exactly simulate tuberculosis of the lungs presenting unexplained type of slow fever, cough, dullness, and hæmoptysis clinically and enlarged lymph glands and fibrosis on x'ray but may be with microfilaria instead of acid-fast bacilli in the coughed up blood. Many cases of the so-called eosinophilic lungs may, in endemic areas, be actually due to filariasis. Similarly, many cases of unexplained type of acute abdomen are of filarial origin. I used to have some trouble in diagnosing them before but with experience and care I can now diagnose them with fair accuracy.

The existence of such cases could be proved by careful application of the 'process of exclusion' plus the presence of microfilaria and the favourable result of the treatment of the assumed condition but cases could

and do exist in which microfilaria cannot be demonstrated though they are definitely of filarial origin. Such cases remain chronically ill and often have repeated atacks of unbearable pain and untold misery and sufferings. The acute problem of filarial diagnosis for research workers is thus to find out some method by which such obscure cases, say of thoracic and abdominal filariasis, could be diagnosed in the absence of microfilaria and easily discernible filarial lesions.

Problems of the Prevention of Filariasis

I have already pointed out that reduction of endemicity rate in an area does not help but makes the matters worse, and that a healthy area could be infected only by mass-infection and mass-transmission. These considerations go to show that we have to adopt preventive measures with two very definite purposes in view—(1) control of filariasis in endemic areas and (2) prevention of infection from endemic to healthy areas.

1. *Control of filariasis in endemic areas*—This task is as stupendous as it is hard and difficult to achieve for its success depends not only on organized group action but on the willing co-operation and honest efforts of individuals as well. In the absence of a specific which could kill and throw out adult worms from the human system, we have to depend on reduction of microfilariæ in the blood by antimony-like drugs for controlling mass-infecting material and on anti-mosquito measures to reduce the intermediary host and thus the mass-infection and on protection of the healthy individuals to reduce mass-transmission. These objects could be achieved by well thought of schemes capable of successful execution and operation and should provide for:—

(*a*) Surveying, charting and mapping out of endemic areas and forming workable divisions on units and systematically recording the presence of all the infected persons living in those anti-filarial units.

(*b*) "Blanketing" of all healthy and diseased persons harbouring microfilariæ in their system periodially to control the number of microfilariæ, at least, in their peripheral blood at all the times. This could be done by the use of antimony-like drugs which are known to kill microfilaria and which have to be administered at predetermined and fixed periods and in tried doses.

(*c*) Anti-larval and anti-mosquito measures which are now well-known to us to control various dangerous species of infecting mosquitoes.

(*d*) Protection of individuals from the bites of mosquitoes by the known or newly invented methods such as the old universal use of nets and mosquito-repellents.

2. *Prevention of infection from endemic to healthy areas*—This is possible through avoidance of mass infection and transmission by restricting and controlling mass movements from endemic to vulnerable areas which lie on sea-coasts and the banks of large rivers and lakes and have Culex fatigans and other known varieties of filaria-carrying mosquitoes. In the case of recruitment for military, agricultural, industrial and other purposes it would be unfair to exclude people of endemic areas but schemes should be there and made operative to see that the blood of recruited persons is free of microfilaria and that the new camps, colonies and 'bustees' do not harbour persons with heavy infection in their blood and if such people do exist, legislation should be there either to send them away or keep them immune from infecting others by the methods detailed in the previous section.

Problems of Filarial Treatment

The main problem that has baffled solution is to find a specific that could eradicate adult filarial worms in early stages and thus prevent filarial lesions. We, at present, possess no drug or measure for the purpose. The only known escape for an infected person is to leave the endemic area and go and live in a healthier place of proved non-endemicity where there is a chance of its dying out in the system without exhibiting any of its manifestations. Medicine and surgery come to the aid only for palliative measures. Drugs are used against the symptoms of anaphylaxis produced by the worms in early stages and against the micro-organisms that secondarily infect the sites of 'kataphylaxis', operated parts or exposed wounds in late stages. Surgery is pressed into action mainly to reduce the area and weight of the affected parts, to restore the shape and functions of the deformed organs or to evacuate pus from the deep-seated abscesses which are not so infrequent in filarial patients. Excepting the early anaphylactoid symptoms and probably the filariasis of the thoracic region all the other lesions belong more or less to the domain of surgery and are collectively known under the vague term, "surgical filariasis", and their problems directly concerns a surgeon rather than a physician. The physicians find that available medical remedies while utterly useless against adult worms cannot fully be relied upon even to kill microfilaria and are often uncertain in controlling the superimposed infections developing in 'kataphylactoid' and devitalized parts; and the surgeons find that in spite of the great advancement in general surgical procedures, the palliative surgical aid as a corrective is woefully undeveloped and thoroughly unsatisfactory in this line. The enormous mass, girth and weight of an elephantoid limb begs efficient surgery but we could devise no satisfactory surgical operation for it. The filarial scrotums with their big areas so liable to acute infections are a source of constant danger to health and life and we are still teaching the removal of every bit of their skin and lodging testes, the so important glands, in an unnatural anatomical position. We practise complete removal of the skin of deformed penis and grafting of the denuded organ which generally leaves it more deformed and functionless than ever. On the whole, it appears to me that good surgeons have taken filarial surgery as of very minor and insignificant import.

However, war surgery is making rapid strides and we note that tubal grafts incorporated with cartilage-supports restore the normal function of an injured male organ in a satisfactory way. Our post-war planning should, therefore, include schemes for efficient medical research and modern surgical training to solve the problems and meet the demands of the curative side of filariasis as well as those of its prevention.

Filaria as I have indicated before is all problems, the importance of which has not yet been fully appreciated in India though it deserves our serious attention

for the preservation of the health and happiness of our people living in endemic areas. My purpose in presenting this paper is not to suggest adequate solutions but to try to give an insight into the intricacies of these problems and to bring them to the notice of the profession and post-war planners to stimulate deeper interest in their existence and solution.

SUMMARY

1. It is pointed out that devastations of filaria in endemic areas equal those of malaria in India.

2. It is shown that practically all the problems of filariasis have remained unsolved.

3. An attempt is made to prove that the problems are important enough to deserve the serious attention of post-war planners in India.

4. Suggestions are made for anti-filarial schemes for the prevention of filariasis and for research work to find a specific for filaria and for provision of facilities for adequate medical and surgical training to tackle its crippling manifestations in a successful manner.

ACKNOWLEDGMENT

I am thankful to Lieut. Col. F. E. R. Laborda, the Chief Medical Officer, E. I. Railway, for permission to put my views before the profession.

REFERENCES

ACTON H. W. & RAO S. S.—*Indian M. Gaz.*, **64**:421, 1929.
Idem—Ibid., **64**:601, 1929.
Idem—Ibid., **65**:512, 1930.
AHMED N.—*Antiseptic*, **37**:213, 1941.
Idem—Indian J. Surg., **3**:16, 1941.
CHOPRA, R. N. & RAO, S. S.—*Indian M. Gaz.*, **64**:131, 1929.
CONNELL, W. K.—*Brit. J. Surg.*, **19**:651, 1932.
CRUICKSHANK, M. M.—*Indian M. Gaz.*, **62**:87, 1927.
FRANCIS, E.—Tice, Practice of Medicine, W. F. Prior Co. Inc. Hagerstown, Maryland. Vol. V, 1929. p. 194.
MAPLESTONE, P. A.—*Indian M. Gaz.*, **73**:8, 1938.
RISHWORTH, H. R.—*Ibid.*, **73**:7, 1938.

(*Continued from page 305*)

the necessary suggestion at the psychological moment is thus far better placed than the specialist.

5. Mantaux test is, given the necessary enthusiasm, quite easily carried out and will be a very great help in determining the correct state of affairs as far as the children are concerned in families with tuberculosis. In many instances a case has been discovered because children had a positive Mantaux.

6. The innocuousness of B.C.G. vaccine, its benefit in children, its use by subcutaneous injection in all who are Mantaux-negative, are I think not only well established as facts, but also are the most important preventive measures available in poor communities as in India.

General practitioners are the best suited to advise the population in general as regards nutrition in general and under the present day conditions in particular when the protective foods are not only exhorbitant in price but are sometimes not available to all.

A large number of families is being drawn inexorably to destruction in the whirpool of tuberculosis. The only life-buoys that can drag out these unfortunate families can be provided by society but it is the duty of the medical profession to organise a provision ample enough in extent and then direct it to the best advantage of determining the time and the manner in which these buoys can be thrown out.

SCABIES

V. GOVINDAN NAIR, M.R.C.P., F.R.F.P.S. (GLAS.)

Venereologist and Dermatologist, King George Hospital, Vizagapatam.

Scabies is one of the common diseases of the skin. It is generally known as "the itch" being an intensely itchy disease. It is a disease of families, communities, and groups where there is intimate contact among the members. Although scabies exists at all times, it develops into an epidemic whenever there is a war, famine, or large scale immigration. This historic fact is again brought into prominence in this World War. It prevailed in an epidemic form during the last Great War of 1914-18, putting out of action a large number of men in active service. A slight increase was reported in the incidence of scabies just before the present hostilities began and it became a formidable epidemic after 1939 when campaigns were started. At present, the disease is very much in the public eye in India as the evacuees from Burma are said to be badly infected with scabies and that they have been instrumental in disseminating the infection far and wide. But a closer study has revealed that a good proportion of these unfortunate, ill clad, unhygienic, famished people are suffering from coccal dermatitis. The conditions favourable for the rapid spread of scabies are the commingling of large bodies of people and their living together in large numbers in restricted areas. Hence it is frequently seen in soldiers in barracks and camps and in evacuation, concentration and famine camps. Another fruitful source of infection is the indiscriminate use and mix up of bedding, clothing, blankets etc. Fire watchers using communal blankets run some risk of getting the infection. It is important to remember that intimate and prolonged contact is necessary for the transmission of this disease. As this condition is ideally present in venereal contact, scabies is still considered by some to be a venereal disease. However, it should not be forgotten that a scabeitic burrow is at times a portal of entry for the Treponema pallidum.

HISTORY

Scabies is an ancient disease. Celsus "fully considered 'scabies' which covered a multitude of eruptions." It was very prevalent all over the world till recently. When Hebra (1816-80) took over his clinic in Vienna, scabies was the most prevalent disease. Statistics showed that out of an annual total of 2.723 cases that attended the clinic, 2,197 were cases of scabies. Radcliffe-Crocker (1905) mentioned it to be an extremely common disease in England among the poor, more common in Scotland and very common in the continent. In the United States of America, its incidence, according to Pusey (1925), has been on the increase and "it is one of the common diseases in public practice in winter." References to the mite are seen in very early mediæval European and Arabian literature: Avenzoar (1113-62) of Cordova, the greatest of Mohammadan physicians in Spain, described the itch mite and almost described its role in the production of scabies. Guy de Chauliac (1300-68), physician to three Popes at Avignon, was the first to

point out definitely the contagious character of scabies." Ambroise Pare (1510-90) described the mite. In his famous letter to Redi in 1697, Bonomo gave a very good description of scabies. This letter not only tells how he demonstrated the mite, but shows the prevalence of scabies among the poor. He says that having observed how poor women picked out on the point of a pin little 'bladders of water' from the 'scabby skins' of their children who had the itch, and cracked' them 'like fleas upon their nails', and how 'scabby slaves in the Bagno at Leghorn' often did the same thing for each other, he 'quickly found an itchy person and asking him where he felt the greatest . . . itching, he pointed to a great many little pustules not yet scabbed over', from one of which Bonomo took out a very small white globule and "observing this with a miscoscope, I found it to be a very minute living creature in shape resembling a tortoise . . . . . " Ernest Bazin (1807-78), one of the famous dermatologists of the St. Louis Hospital, Paris, made a thorough study of scabies and showed that the acarus remained scattered all over the body. He also introduced effective methods of treatment which revolutionised the treatment of scabies in hospitals.

Definition

Scabies is a contagious disorder of the skin caused by an animal parasite, Acarus scabiei or Sarcoptes hominis, and characterised by the formation of burrows, tunnels, cuniculi or galleries on the superficial layers of the epidermis with intense itching which is worse during the early part of the night.

Ætiology

The disease is caused by an animal parasite, Acarus scabiei or Sarcoptes hominis, belonging to the class of Arachinda and of the Order of Acarina. It has a universal distribution. The itch mite is round or oval in shape and is just visible to the naked eye as a minute speck. A fully developed ovigerius adult female measures 400 by 300 microns or 0·4 to 0·3 mm. The adult male is smaller than the ovigerous female being only one-half to two-thirds the size of the latter. The adult male prowls about on the surface of the skin and dies after copulation. The itch mite has a round body with no head and 4 pairs of legs. The mouth parts are at the anterior end and the anus at the posterior end. In the female the two anterior pairs of legs end in suckers or ambulacra and the two posterior pairs in bristles. The male has suckers in all the legs except in the third pair. On the back, besides striæ and bristles there are sharp spines directed backwards. The acarus is not a blood sucking insect; it lives on surface epithelium and skin secretion.

As in practically all the animal parasites, the female alone takes part in the ætiology role in diseases, either as producers or transmitters. The male has no part or lot in the production or transmission of the disease. It lives only for the propagation of the species. When an impregnated adult female is placed on the surface of the skin it takes about an hour for it to dig into the epidermis. It tilts itself on the posterior bristly legs and bores an oblique, zigzag tunnel through the superficial layers of the epidermis, but never goes beyond the granular layer. In the stratum Malpighii, at the inner end of the channel and just below where the acarus is lying, a small vesicle develops. The burrow is filled with the excreta and ova of the acarus in different stages of development. The ova are oval in shape and measure 150 by 100 microns (0·15 by 0·10 mm.). They are placed in the tunnel with their longitudinal axes transversely. As it burrows the female acarus lays her eggs one or two every day, in all about 20 to 50 eggs by the time it reaches the end of her jounrey. About the middle of the ventral aspect there is a slit through which the eggs are laid. The female acarus lives at the blind end of the tunnel for about two or three weeks and dies. The ova hatch in about 4 or 5 days and the six legged tiny larvæ reach the surface of the skin either as the result of the normal keratinisation or by their boring through the thin roof of the tunnel. The larva moults twice before it becomes an adult. By the first moult the hexapod larva becomes an octopod nymph. The nymph resembles an adult but has no sexual organs. It is estimated that only about ten per cent of the ova reach the adult stage. The female acarus lives on the whole about two to three months making a burrow of 2 to 20 mm. long. The life history of the acarus from the egg to the ovigerous female is about 10 to 14 days.

Various species of acari, morphologically indistinguishable from the human species, are found in horse, sheep, goat, dog, pig, fowl, camel and other animals.

Mode of infection—The disease is transmitted from individual to individual by intimate, prolonged, nocturnal contact with an infected person. The disease is not contracted by touching or shaking hands with an infected person as the acarus moves slowly. It is usually contacted while sleeping in the same bed with an infected person or rarely from infested bedding, clothing and blankets. But the investigations of Mellanby and others show that the risk of infection from such latter sources is negligible. Scabies is frequently of venereal origin as the conditions are ideal for prolonged intimate undressed contact with an infected person on bed in the night. The disease also spreads by the intimate contact of family life and by crowding together in lodging houses, barracks, camps, etc., with limited space. Over-crowding, unhygienic surroundings, and want of cleanliness are other important contributory factors in the dissemination of this human pest. The disease is also transmitted by what are known as "scabies carriers". These carriers harbour Acarus scabiei on their body without experiencing itching. Persons in the early stage of the disease before the development of signs or symptoms but with enough acari on them are also dangerous to the society. These two sets of people come in intimate contact in social life and are thus able to broadcast the disease. It is more commonly seen among the poor and the careless, but scabies is not at all a poor man's disease. Like other verminous diseases it is more common in winter due to closer herding. It occurs at all times of life, though more common in childhood and early adult life. It affects both the sexes equally in children, but in adults males preponderate. But at present in Britain "among

young adults females appear to be twice as commonly affected as males" (Mellanby, 1943). This is partly due to their looking after the children and partly to the sharing of beds. There is no immunity reaction in the host. On the other hand relapses and reinfections are the rule.

Incubation period—The incubation period is about two to three weeks. It may extend up to two months as a decent mite population must grow before the disease manifests itself.

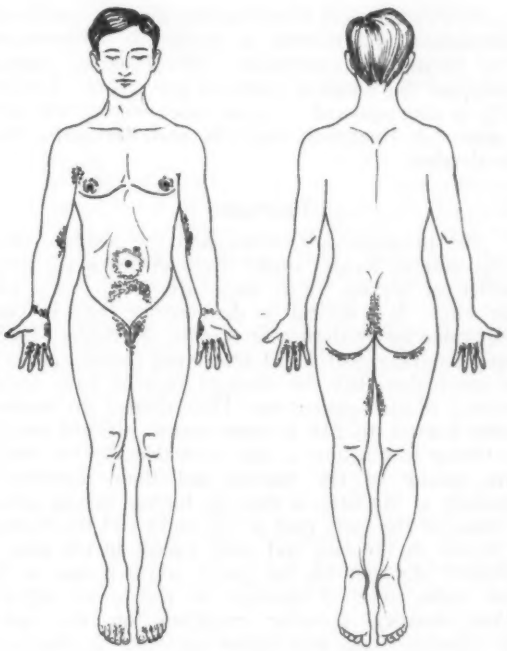
Signs and Symptoms

Constitutional symptoms are unknown in scabies. The only symptom complained of is itching which has given the disease its name. It is very intense and worse in the early part of the night when the patient gets warm in bed. There may be little or no itching during the day as the habits of the acarus are nocturnal. The itching is due to the burrowing of the skin by the female acarus. This induces scratching and in this act a good number of them are killed and some are conveyed under the finger nails to different parts of the body. The young mites also prowl about and reach different parts of the body before getting impregnated.

The characteristic scabietic lesion is the burrow, cuniculus, tunnel or gallery. It is a narrow, sinuous or zigzag channel which is more or less horizontal to the surface of the skin. It is filled with fæces and ova in different stages of development with the female acarus at the opposite end which is indicated by a whitish or yellowish shiny point. The burrows may be dark coloured in dirty persons and can be easily detected. In clean individuals they are lighter and difficult to make out. In infants and children they are long and well developed. In the hands of labourers they are small and poorly developed. During the last war, it was observed that the hands of soldiers were comparatively free from burrows. The tunnel made by the mite is too narrow for it to turn round and come out. It cannot also retrace its steps as the dorsal spines come in the way. So the unfortunate female acarus has to perish in the grave dug by herself. These tracks are about 2 to 20 mm. in length.

When the disease is fully developed a multiplicity of lesions are met with. The number and extent of the lesions vary within wide limits. Galleries or burrows of varying length and colour, vesicles of different sizes situated near the burrows, inflammatory papules, pustules and crusted lesions in various stages of evolution, excoriations, scratch marks, patches of dermatitis and possibly pigmented areas are all seen. A red follicular rash is also present as a result of the young mites hanging on to the hairs. Allergic manifestations from sensitisation to the protein of the acarus may also occur.

Sites of predilection—The acarus selects moist, smooth and thin areas of skin for easy burrowing. The sites therefore to look for the burrows and the acari are the dorsal aspect of the webs and opposing surfaces of the fingers and toes, the ulnar aspect of the hands, the anterior aspect of the wrists, the inner aspect of the elbows, the anterior axillary folds, and the lower abdomen particularly encircling the umbilicus in both the sexes, the lower buttocks and genitalia in men and the nipples and areolæ in women. In infants' palms and soles also are involved. Other parts of the skin also are affected but the face and scalp always escape, except in the case of infants in arms in whom these areas also may be affected by close contact with the mother's chest when she is a victim. The majority of the lesions are seen between the shoulders and knees. The areas of involvement are those most accessible to the hands, giving a clue that the mites are mostly transported under the finger nails. Scabietic lesions have a predilection for parts exposed to friction such as shoulders, waists, outer aspect of thighs and ischial tuberosities particularly in shoe-makers and tailors who sit at work constantly in one position.



Scabies—Sites of Election

MacCormack (1944) describes three clinical types of scabies, according to the type and distribution of the lesions; uncomplicated or straight scabies, scabies uncomplicated by pyodermia and scabies complicated by eczema or dermatitis.

Uncomplicated (straight) scabies—In this type three kinds of lesions are present: the scratched or follicular papule of which most of the eruptions are composed; vesicles; and burrows. The scratched papules are collected and grouped about the anterior axillary folds, and over the abdomen in a circle centred by the umbilicus. The pin-head vesicles and the burrows are mostly on the hands and wrists, especially on the webs of the fingers. Ankles and feet are sometimes similarly involved. By contrast, the back is relatively free, and the face is not affected, except rarely in infants.

Scabies complicated by pyodermia—In this, impetiginous sores form especially on the lower buttocks, elbows and knees. Indeed, a grouped impetigo on the lower buttock can have only one interpretation and its paramount importance as an aid to diagnosis cannot be too strongly emphasised.

Scabies complicated by eczema or dermatitis—A potentially eczematous subject is able to develop slight or extensive eczema or dermatitis from the irritation caused by the parasite, that is independently of any external application whatsover. In these cases the eruption is liable to be most marked over friction areas—the shoulders, the outer thighs and the waist—giving a hint of underlying parasitic disease.

Complications

Besides the skin complications already mentioned —pyodermia and eczema or dermatitis—albuminuria is a frequent complication. Sleeplessness, mental worry and the resultant cachexia are others. Eosinophilia is common and in some cases leucocytosis also is seen. A treatment nephritis and dermatitis may also develop.

Diagnosis

The presence of burrows and the demonstration of the mite or its ova under the microscope are proof positive of scabies. But these are more easily said than done. It is difficult to demonstrate them in cases complicated by pyodermia or eczema. Mellanby (1943) after examining nearly 900 adult male patients came to the conclusion that the average parasite rate (adult females) in each patient was 11·3, though the number varied from 1 to 511 in some cases. It will not be far wrong to diagnose a case of scabies by the multiform nature of the lesions and their distribution especially at the sites of election, intense itching which is worse in the early part of the night and the absence of lesions in the face and scalp except in the case of children. Lesions on the penis and scrotum in the adult male, grouped impetigo on the lower buttocks (MacCormack), pustular eruptions on the hands (R. Crocker) are also important from a diagnostic point of view.

Differential Diagnosis

Industrial dermatitis—Both scabies and trade dermatitis affect hands. But the burrows, multiform nature of the lesions and their sites of election, nocturnal itching and the existence of more than one case in the family are all in favour of scabies. Trade dermatitis affects exposed parts including the face which is exempt in scabies.

Cheiropompholyx—Sago grain vesicles on the hands and wrists are the only lesions in this. They are deeply seated, more palpable than visible, more numerous and more difficult to rupture than the scabietic vesicles. Further the itching disappears on bursting.

Secondary syphilis—The syphilitic rash is generalised, hard, indurated and coppery with no itching. Other signs of secondary syphilis and the positive complement fixation or precipitation test will be helpful.

Lichen urticatus—This is a disease of children and the lesions are red papules and situated more on the outer aspect of the limbs. There are no burrows nor is the disease contagious.

Pediculosis corporis—The lesions are practically confined to the trunk and proximal ends of the extremities though the bulk of the lesions are on the upper buttocks and the back which are relatively free in scabies. No lesions are seen on the hands and wrists and no burrows. Pediculi can be seen in the seams of underclothing.

Prognosis

Prognosis is good if properly treated. It is a curable disease even after it is present for long periods. But there is no tendency for spontaneous disappearance of the disease. Mellanby (1943) thinks that by constant scratching the patient may eventually get rid of the parasites and get cured.

Treatment

The aims of treatment are the destruction of the parasites and their ova; the relief of itching; the management of the cutaneous lesions and disinfection of all the articles of bedding, clothing, blankets, etc.

The treatment of scabies is entirely by the external application of an efficient parasiticide in order to destroy the acari and their ova followed by appropriate external application for the relief of itching and the cure of the secondary lesions. In the selection and use of a sarcopticide it should be remembered that both over and under treatment are equally bad. The medicament should not be applied either too strong or too weak. Various drugs have been used for the treatment of scabies from time to time but the most effective and also time-honoured, traditional and classical drug is sulphur. Sulphur itself has been used in different forms, in different combinations and in different strengths, but the most efficient, the least dangerous and the easiest to manage even by unskilled hands is the *ten per cent sulphur ointment*. After investigating a variety of sarcopticides including different preparations of sulphur, Dr. Kenneth Mellanby and associates (1942) came to the conclusion that the good old ten per cent sulphur ointment still deserved the pride of place. Here a word of caution seems to be necessary. In dermatological practice, the naming of a drug or the writing of a prescription by itself is only of secondary importance. It is the method of application in its minute detail that counts for the success or failure of the treatment. And the treatment of scabies is an outstanding example proving this rule.

There is some controversy regarding the desirability of giving a preliminary cleansing bath before the application of any external remedy. The older dermatologists have all insisted on a thorough scrub and bath in hot water with soap and brush. The recent investigations of Mellanby *et al* (1942) have shown that "even without bathing and scrubbing, very few mites survive and two applications of the oint-

ment have cured 100 per cent of the cases." But they also admit "that the efficacy of the treatment is slightly enhanced by bathing and scrubbing, although the difference between the results (per cent killed) from the two types of treatment is not statistically significant. However a cleansing bath will be wholesome to the patient and at the same time the medicament will penetrate the skin better.

Another important fact that has emerged from this investigation is "that a very high proportion of the mites were killed by one application of the ten per cent sulphur ointment and two applications gave 100 per cent cures. But the standard treatment recommended by the Ministry of Public Health in the United Kingdom consists of three daily applications. The old practice was 5 or 6 successive applications at intervals of 12 hours.

The treatment of scabies with ten per cent sulphur ointment is as follows:

1. A thorough bath and scrub is given with warm water and soap, preferably soft soap. The patient should remain in the bath for 20 to 30 minutes, using the brush now and then to lay open the burrows. A rough cloth or wood wool may well serve the purpose, as scrubbing with a nail brush is too harsh and painful. The sites of predilection should receive special attention. Cut the finger and toe nails short.

2. The patient then dries himself and while still warm rubs ten per cent sulphur ointment from neck to toes, paying particular attention to the sites of election. The ointment should not be applied to the face and scalp. He then puts on some old clothing which should not be changed for the duration of the treatment. The patient should always keep some ointment with him to be used when itching occurs any where. Fresh ointment should be rubbed every day for two more days. During these three days the patient neither bathes nor changes his clothes. The quantity of ointment required for one application is about three ounces and so the complete treatment requires 8 to 10 ounces for each patient.

3. On the fourth morning the patient takes a warm bath with soap and dons clean clothes. He will be found now cured of scabies.

The itching becomes less even after the first day of treatment, as most of the acari would by this time be killed. But some itching may continue for a few days more even after the complete course of treatment. For this a cream (zinc cream) or a lotion (calamine lotion) containing acid carbolic 2-5 m., ichthyol 5-10 grs., or tar 5 m to the ounce is helpful. Over treatment, under treatment and improper treatment should be avoided. Sulphur ointment has gained some notoriety by over treatment as it produces sulphur dermatitis with severe itching. Sometimes this itching is mistaken for the itching caused by the itch mite and so more ointment is applied which naturally aggravates the condition. For sulphur dermatitis, liniment calamine is an excellent remedy. At the same time the importance of thorough treatment cannot be overemphasised. Even if one ovigerous live mite is left, a recurrence of the disease is likely. It may take several weeks before the recurrence manifests itself as time must elapse before a reasonably large mite population could grow up again. It was estimated that a pair of itch mites is able to produce 1,500,000 descendants in three months. The experiments of Mellanby and co-workers (1942) prove that "the medicaments which kill these (mites) are also reasonably effective against their eggs." In cases of complicated scabies, it is advisable to treat the secondary infection first and scabies later. For the former we have found painting the affected areas with two per cent aqueous brilliant green which dries up the lesions in two or three days. It is much easier and more successful to treat the scabies afterwards.

Other points to remember in the treatment of scabies are:—

1. All contacts must be examined and those found infected must receive treatment immediately.

2. All cases in the same family or group must be treated simultaneously to prevent reinfection. Some of the recurrences are the result of failure to observe this rule.

3. All bedding, clothing, blankets, gloves, socks, stockings, bedroom slippers, wrist watch straps, wrist straps, strings of identity discs, etc., in fact anything which was in actual contact with the patient's skin, must be disinfected before they are used again. In tropical countries those articles that cannot be boiled, or where steam sterilisation is not available, may be sterilised by exposure to the sun for a couple of days. Mellanby (1943) considers that the risk of reinfection from not sterilising the bedding and clothing is practically nil though the general opinion is in favour of sterilisation if facilities are easily obtainable.

4. Children should be treated with weak sulphur ointment, 3-5 per cent.

Other preparations that have been in use are:—

Sulphur vanishing cream—It is a pleasant preparation to use with the added advantage that it does not soil the clothes. Ten per cent of sulphur in the cream is as good as the same strength of the ointment. (Mellanby, 1942).

Ehlers-Marcussen's ointment—This is a specially prepared sulphur ointment by a special process and marketed with the proprietary name of "Kathiolan". It is very much used in the British Navy. Till 1932, this was the treatment adopted in Copenhagen and is also known as the Danish treatment. This has to be used just like the ten per cent sulphur ointment, but one day's treatment cures scabies. Mellanby's investigation also testifies to 100 per cent cure with one day treatment. But the chances of developing sulphur dermatitis are more marked.

Flowers of sulphur—Sherwell suggested the rubbing of washed sulphur after the bath and scrub for which half a teaspoonful is required. An equal amount has to be dusted on the sheets also. Mellanby and associates (1942) dusted flowers of sulphur over the patients and in their sheets confining them to bed. They found it to be ineffective as only a few mites were killed at the end of 24 hours and even after three days of treatment one-third of them were still found

alive. There is also a great danger of developing sulphur dermatitis.

Sodium thiosulphate and hydrochloric acid—It has been thought that nascent sulphur would be more effective in destroying the acarus. With this object, the patient is first painted from neck to toes with a 40 per cent solution of sodium thiosulphate—the hypo of the photographer—which is allowed to dry. Fifteen minutes later, a 4 per cent hydrochloric acid is applied over the same area. One hour after this, the applications are repeated. A second treatment is given the next day and the patient takes his bath the third day. Cure is said to follow this. Sulphur so released is considered to be more harmful to the sarcoptes than the ordinary sulphur. Mellanby and co-workers remark that patients so treated had their body covered with a yellow powder, *i.e.,* sulphur is deposited in rather coarse granules. Their investigation showed that one application of the treatment was "hardly more effective than dusting with flowers of sulphur, and even after three applications a substantial proportion of the parasites remained alive." Further, this method of treatment is troublesome to employ, the results are unsatisfactory and it may lend itself to zealous overtreatment

Sulphur lather tablets (Sulphomil)—The conclusions of Mellanby and associates are "even after 3 daily applications, a substantial proportion (about 50 per cent) of the parasites were still alive". Thus they are comparatively of little use.

Colloidal sulphur—The external application of colloidal sulphur was recommended by Heden who found that one application effected a cure.

Fumigation with sulphur—This method was tried during the last Great War when large number of patients had to be treated in a short time. Chlorine gas was also used for the same purpose.

Sulphur by mouth—Mellanby in 1941 reported that sulphur taken internally had no effect on acarus. It was again investigated by administering 10 g. daily for 10 days and it was found that "the parasites appear to be entirely unharmed at the end of the period, and fresh mites could be induced to burrow normally".

Other preparations containing sulphur—Sulphur in different proportions and combinations have been used from time to time for the treatment of scabies. Some of them are given below. Pusey used, in preference to other methods, an ointment containing sulphur precipitate, balsam of peru, creta preparata, and green soap each 20 to 40 grains and vaseline one ounce.

Wilkinson's salve is made of creta preparata 10 parts, sulphur sublimate 15 parts, ol. rusci 15 parts, saponis mollis 30 parts, and adeps 30 parts. Heimerich's pomade consists of sulphur sublimate 10 parts, distilled water 5 parts, almond oil 5 parts, potassium carbonate 5 parts, and yellow petrolatum 60 parts.

Oppenheim and Smith (1943) recommend the following prescription for the "Treatment of Scabies in War Time". Precipitated sulphur 25 parts, potassium carbonate 10 parts, and yellow petrolatum 125 parts. This quick method was successfully used in treating over 60,000 persons in Germany during the years 1918-22. The patient rubs his body for 15 minutes with green soap and wood wool when he is put into a warm bath of 30°C and rubbed again with green soap and wood wool or brush for half an hour. After drying, the above ointment which is a modification of the old Hardy which again is a modification of the older Helmerich ointment, is smeared with particular care over the areas of burrows. After two hours the patient gets a shower bath with common soap. After drying, his entire body, except head and neck, which was smeared with sulphur ointment, is now smeared with zinc paste (30 g. each of zinc oxide and purified talc and 60 g. yellow petrolatum). The whole treatment thus takes only 3 hours. Even children can be treated by this method but the time of application of green soap is shortened to 5 or 10 minutes and that of the ointment to a quarter to half an hour.

Dimethyl-diphenylene disulphide (dimethylthianthrene)—This is a Bayer's product marked under the trade name of "Mitigal". In their investigation Mellanby *et al* (1942) found that "It does not seem to produce any dermatitis or discomfort, and kills 100 per cent sarcoptes after one application." The substance is costly and is not available at present.

Derris root preparations—This is one of the drugs investigated by Mellanby and co-workers. They remark that "derris is notorious for causing dermatitis in man, and unless it has substantial advantages in the treatment of scabies its use is not one which recommends itself." They tried *Derris root lotion* which is a suspension of derris root in water (4 ounces of root in one gallon of water with a small quantity of soap flakes). The results were unsatisfactory as "even after three days 21 per cent of the mites survived and about 50 per cent of the patients still harboured living sarcoptes."

Rotenone emulsion—A 2 per cent emulsion of rotenone called "Sarevan" was tried. Usually rotenone is used 1 in 16,000 as animal dips in veterinary practice. The derris root lotion mentioned above was 1 in 1,000 and Sarevan was 1 in 50. Notwithstanding, they did not find it "outstandingly successful". Four applications gave a satisfactory cure, "but some of them developed an intractable scrotal dermatitis". They found this method also "much less effective than sulphur ointment".

Benzyl benzoate—This is not a new drug newly introduced for the treatment of scabies. It is one of the chief constituents of Balsam of Peru which is used by itself or in combination with sulphur or betanaphthol from early days. Benzyl benzoate as such was used by Sachs and Juliusburg so early as 1900. MacCormack mentions that this drug has been in use for the last 50 years and was recommended by both Radcliffe Crocker and Malcum Morris. According to Kissmeyer, it was first tried by Ludwig Neilson with success in 1912. Kissmeyer himself popularised it by substituting it in the place of the time-honoured sulphur ointment in the Kommune Hospital at Copenhagen from 1933 onwards. He used it as a lotion consisting of equal parts of soft soap, isopropyl alcohol and benzyl benzoate. According to him "The whole treatment takes less than an hour, and is an ambulatory one." The

patient first annoints the whole body with soft soap, then soaks himself in a warm bath of 100°F also rubbing while in the bath. After coming out of the bath and while still wet, the lotion is painted with a brush for 5 minutes over the entire body with the exception of the face and scalp. He then rests a while to get the lotion dried. A second coating is given for another 5 minutes. The body is then gently dried by a towel and the patient puts on the same clothes. After 24 hours a second bath is taken and clean clothes are worn. From 1933-37 Kissemeyer had treated some 8,000 cases and in his hands "it has proved to be an ideal, effective and cheap method giving rise to no serious post-therapeutic dermatitis."

Then investigations of Mellanby *et al* (1942) also lend support to the findings of Kissmeyer. But they think that in unskilled hands without proper supervision, benzyl benzoate lotion may be applied carelessly as to miss some of the burrows resulting in relapse. They tried benzyl benzoate in different strengths from 5 to 20 per cent as a lotion with spirit and with spirit and soft soap and as a watery emulsion. They consider a 220 per cent emulsion to be completely satisfactory. The National War Formulary gives the composition of the emulsion as benzyl benzoate 25 per cent, lanette wax S.X. 2 per cent, and water to 100. The treatment consists of a preliminary bath and drying followed by the application of the emulsion with an ordinary flat paint brush 2 inches wide. This should be done carefully and systematically so that the entire body from neck to the soles are thoroughly painted. The body is then allowed to dry which takes about 5 to 10 minutes. The patient then puts on his dress and the treatment is over. A single application would suffice usually but in some cases a second application may be necessary when it should be carried out the next day or within 4 or 5 days of the first treatment. This treatment gives 100 per cent cures. In MacCormack's special scabies clinic where benzyl benzoate is exclusively used, a recurrence rate of just over two per cent has been observed, probably from failure to treat the whole family in some cases. At the Poolsbrook Treatment Centre, Graham (1943) treated about 1,000 cases of scabies and came to the conclusion that one treatment with benzyl benzoate would cure over 99 per cent of cases of scabies if efficiently applied. Disinfection of clothing and bedding is unnecessary according to him.

Lethane—This is an organic thiocyanate and is an effective parasiticide for lice. A two per cent solution appears to kill only about two-thirds of the mites after one application. A ten per cent solution causes considerable discomfort to the patient but is less efficient than benzyl benzoate or sulphur ointment. (Mellanby *et al*, 1942).

Betanaphthol—This drug is used from olden days as a substitute for sulphur or in combination with it or balsam of Peru. It is useful particularly in children and in those with a delicate skin. It is less irritating but has an unpleasant smell. Kaposi's original prescription was made up of betanaphthol 15 parts, creta preparata 10 parts, saponis 50 parts and adipis 100 parts. Mellanby *et al* (1942) found it even as a ten per cent ointment less satisfactory than benzyl benzoate. The possibility of poisoning by the drug should be remembered.

Pyrethrum—The tests do not suggest that pyrethrum extracts are particularly valuable against human scabies. (Mellanby *et al*, 1942).

Balsam of Peru—This is another useful substitute for sulphur. As stated above it is used either alone or in combination with sulphur and/or betanaphthol as an ointment. It may be painted on pure or diluted with equal parts of spirit, glycerine or olive oil. It is expensive and is liable to cause nephritis.

Tetraethylthiuram monosulphide—Gordon and Seaton (1941) found this drug useful in the treatment of animal scabies. They also found it to be more toxic and lethal to both the mites and their eggs. Percival (1942) tried this drug and found it capable of curing human scabies in 5 per cent concentration. It was non-irritating to the human skin nor did he notice any form of cutaneous idiosyncrasy. Further it is cheap, clean and easily available.

Norwegian Scabies

This type was first described by Boeck and Danielsson of Norway as one usually seen among lepers and vagrants. The disease is characterised by extensive crusting and riddled with burrows filled with Acarus Scabiei. In these cases a generalised scaling occurs. In this condition the face and scalp also are affected.

Animal Scabies

It is not infrequently that animal scabies is transmitted to human beings. The characteristic burrows of human scabies are not seen. The eruptions are small red papules and are seen on the arms and other exposed parts of the body that come in contact with infected animals. Horses, camels, sheep, dogs, cats, etc., are the commonly affected animals. When the source of infection is found out and cut off the disease dies out by itself. The treatment also is much easier as it is more amenable to sulphur ointment than human scabies.

References

Graham, J. R.—*Brit. M. J.*, **1**:413, 1943.

Mellanby, K.—Scabies. Oxford University Press, London 1943.

Mellanby, K., Johnson, C. G. and Bartley, W. C.—*Brit. M. J.*, **2**:1, 1942.

Kissmeyer, A.—*Lancet*, **1**:21, 1937.

MacCormack, H.—*Practitioner*, **152**:291, 1944.

MacKenna, R. W.—Diseases of the Skin, Bailliere, Tindall & Cox, London, 1933.

Macleod, J. M. H.—Diseases of the Skin, Lewis & Co., London, 1920.

Oppenheim, M., and Smith, H. A.—*Arch. Dermat. & Syph.*, **48**:370, 1943.

Ormsby, O. S.—Diseases of the Skin, Henry Kimpton, London, 1935.

Percival, G. H.—*Brit. M. J.* **2**:451, 1942.

Pusey, W. A.—The Principles and Practice of Dermatology, D. Appleton & Co., London, 1926.

Pusey, W. A.—The History of Dermatology, Bailliere, Tindall & Cox, London, 1933.

Radcliffe-Crocker, H.—Diseases of the Skin, H. K. Lewis, London, 1905.

Roxburgh, A. C.—Common Skin Diseases, Lewis & Co., London, 1939.

JOURNAL OF THE

INDIAN MEDICAL ASSOCIATION

CALCUTTA, SEPTEMBER, 1945

NUTRITIONAL FACTOR IN CIRRHOSIS OF LIVER

Cirrhosis of liver is traditionally related to alcoholism. Even in the latest editions of textbooks[1] we find, "A very large majority of patients with cirrhosis of liver have indulged excessively in alcohol." But occurrence of cirrhosis of liver in children and in persons who had not tasted any alcoholic beverage, initiated workers to look for some other cause for cirrhosis of liver and ascites.

Recent attempts to correlate nutritional disturbances with cirrhosis of liver is a distinct advancement, if not in treatment but for prevention of the disease. Opie and Alford[2] showed in 1914 that damage of liver due to chloroform poisoning in dogs depend, largely on the diet they take. But the correlation of dietetic insufficiency and hepatic damage, a positive finding, was first demonstrated by Weichselbaum[3] in 1935. No notice of this work was taken at the time of its publication till Györgi and Goldblatt[4] (1939) and Rich and Hamilton[5] (1940) claimed to have produced cirrhosis of liver by dietetic means. This was followed by reports of various authors on the subject and a general agreement was reached that fibrotic lesions in the liver developed in animals on certain deficient diets. Hardikar and Rao[6] published a preliminary note on the aetiology of ascites in Hyderabad. They have shown with their case reports that the ascites is due to prolonged general malnutrition. From epidemiological data the authors conclude that cirrhosis of liver has a higher incidence in the South-Eastern parts of India, where rice is the staple diet, than in the North-Western parts, where wheat is staple diet. Their finding is in accord with that of Johnson[7] who also points out the frequency of cirrhosis of liver in Southern India. He, however, does not endorse wholly the malnutrition theory. In his area of investigation the staple food is tapioca and tapioca has been known to become toxic by certain methods of preparation. He, therefore, believes that cirrhosis is partly due to toxin and partly due to dietetic error. Himsworth and Glynn[8] believe that the hepatic cirrhosis caused by dietetic error is of two kinds, "One is a massive acute necrosis which either kills or leads to post-necrotic scarring and nodular hyperplasia; the other is diffuse hepatic fibrosis of insidious development, which closely resembles portal cirrhosis. Both, in their final stages, produce a fibrotic lesion of the liver (Himsworth[9]). These workers have shown that the production of the first type mainly depends on the amount of dietary protein consumed. When this falls below the minimum level, massive hepatic damage results. No other contents of diet—vitamins, choline, fat or carbohydrate has any influence on the production of this particular kind of liver necrosis. This fact was also recognised by Lillie and co-workers[10] in 1941. The second type of lesion is characterised by a heavy fatty infiltration of the liver (Himsworth and Glynn). Naturally to produce this the diet should either be very rich in fat or deficient in lipotropic factors. Speaking of these conditions in man, Himsworth[11] opined that "The hypothesis that massive hepatic necrosis in the man may result from an inadequate supply of protein to the liver, whether this inadequacy is brought about directly or indirectly, must therefore, be considered to be a serious possibility" and "It thus appears that all over the world portal cirrhosis is associated with consumption of defective diets which are productive of fatty infiltration of the liver; and, further, may develop into protal cirrhosis. Whether alcohol in excess may contribute to the development of this lesion by a direct toxic action on the liver cells is still unsettled. But even if it can, it appears that such a contribution is gratuitous and that the apparent association of portal cirrhosis with alcohol can more easily be explained as a result of the malnutrition consequent upon alcoholism" Methionine has been used for the first type of cases with varying results.[12, 13, 14].

Gillman and Gillman[15] have recently published the results of their investigation in hepatic damage in infantile pellagra. By means of liver biopses they have established that the hepatic damage in infantile pellagra correspond to the second type of cirrhosis described by Himsworth and Glynn. They offer very interesting results. They show that administration of vitamins increased the fatty degeneration of the liver cells, liver extract, though useful is incapable of coping with such massive concentration of fat, while stomach extract has been found by them to be the most suitable lipotrope to be used in this condition.

In conclusion, we must warn our readers in terms of György[16] who while presenting his data on experimental hepatic injury emphasises that premature application of laboratory findings in therapeutics may be dangerous.

---

[1] Hurst A. F.—A Textbook of the Practice of Medicine, p. 701 Edited by F. W. Price, Oxford University Press, London, 1942.
[2] Opie, E. L., and Alford, L. B.—*J.A.M.A.*, **62**:895, 1914.
[3] Weichselbaum, T. E.—*Quart. J. Exper. Physiol*, **25**:363, 1935.
[4] Gyorgi, P. and Goldblatt, H.—*J. Exper. Med.*, **70**:185, 1939.
[5] Rich, A. R. and Hamilton, J. D.—*Bull. Johns Hopkins Hosp.*, **66**:85, 1940.
[6] Hardikar, S. W. and Rao, V. G.—*J. Indian M. A.*, **13**:1, 1943.
[7] Johnson, A. S.—*Indian M. Gaz.*, **78**:227, 1943.
[8] Hisworth, H. P. and Gylnn, L. E.—*Clin. Sci.*, 5:93, 1944.
[9] Himsworth, H. P.—*Proc. Royal Soc. Med.*, **38**:101, 1945.
[10] Lillie, R. D., Daft F. S. and Sebrell, W. H.—*Pub. Health Rep.*, **56**:1255, 1941.
[11] Himsworth, H. P.—*Proc. Royal Soc. Med.*, **38**:104, 1945.
[12] Beattie, J.—*Proc. Royal Soc. Med.*, **38**:107, 1945.
[13] Wilson, C., Pollock, M. R. and Harris, A. D.—*Brit. M. J.*, **1**:399, 1945.
[14] Higgins, G., et al.,—*Ibid.*, 401, 1945.
[15] Gillman, T. and Gillmann, J.,—*J.A.M.A.*, **129**:12, 1945.
[16] Gyorgi, *P.*,—*Am. J. Clin. Path*, **14**:67, 1944.

CURRENT MEDICAL LITERATURE

Psychosis Due to Mepacrine

Gaskill and Fitz Huge (*Bull. U. S. Army Med. Dept.*, **86**:33, 1945, Ref. Ed., *Brit. M. J.* **1**:162, 1945) in reporting on psychosis occurring after using fairly low doses of mepacrine (2·1 gm) given during about 6 days in the treatment of acute malaria write that the symptoms, though interesting, were quite rare, affecting only 35 men out of 7,604 who were treated—*i.e.* only 0·4%. The onset took place between the third day after the beginning of treatment and the twelfth day after its end. There were two main types. In one there was an abrupt change of behaviour with an increase in motor and psychomotor activity; sometimes hallucinations, delusions, and disorientation occurred; the general impression was of euphoria and expansiveness. In the other type there was a gradual and insidious onset of retardation of the mind and confusion; there was a gradual clouding of the sensorium, with disorientation and loss of recent memory; the patients were withdrawn and seclusive; and the general picture was one of bewilderment and fearfulness. Laboratory tests showed nothing abnormal. Treatment was palliative. Thirty-three of the 35 patients recovered completely, the average time needed being 23 (8-85) days. When the return to normal behaviour began it was completed quickly in one to two days. Subsequently half of these patients were given the same course of mepacrine again, and no serious symptoms occurred. As regards diagnosis, the chief point is to exclude cerebral malaria, which should be suspected in all cases of peculiar mental reaction in the tropics until disproved. In psychosis due to mepacrine it should be noted that the patients have recently received antimalarial treatment, that the slight initial fever which may be present in a few cases subsides in 12 to 24 hours, that the symptoms are all psychiatric, that the behaviour pattern remains constant, and that there is no objective neurological disturbance. The explanation of these cases is not clear. It is known that very large doses of mepacrine cause mental disturbances even in normal persons; but in the patients just described the dose was not abnormally high. Probably a combination of mepacrine, malaria, personal idiosyncrasy, and the hardships of warfare may be involved. Whatever the cause, it should be remembered that these toxic effects are rare and relatively unimportant compared with the damage which can be caused by malaria. It is interesting and useful to know that they can take place, but their possibility should never deter the confident use of this valuable prophylactic and therapeutic antimalarial compound.

Pre-sternal Oedema in Mumps

Gellis and Peters (*Bull. Johns Hopkins Hosp.*, **75**:241, 1945) found among 502 soldiers with mumps admitted to an American military hospital, thirty who developed pre-sternal œdema, *i.e.*, an incidence of 6 per cent. The œdema usually appeared on the third to eighth day of the illness, the average being 5-8 days, and on the average it persisted for five days. In twenty-five of these patients the submaxillary glands were enlarged when the œdema appeared, and in the remaining five patients, in whom only the parotid glands were involved, the œdema was slight and of brief duration. The area of œdema extended downwards to between the third interspace and the xiphoid process, whilst laterally it ranged from just lateral to the sternum to the midclavicular line. No correlation was found between the severity of the parotitis and the degree of œdema. There was no engorgement of superficial veins in the chest or neck. Only five patients complained of symptoms coincident with the appearance of the œdema: two complained of dysphagia, one of hoarseness, and two of tenderness over the œdematous area. No involvement of the thyroid gland could be detected and x-ray films showed no evidence of enlargement of the thymus gland or any other structure in the upper chest or neck. Impressed by the large number of these patients who had involvement of the submaxillary glands, the authors suggest that this pre-sternal œdema may be due to obstruction by these enlarged glands of the lymphatic drainage from this area.

Diabetes Mellitus as Observed in 100 Cases for Ten or More Years

These four papers (*Am. J. Med. Sc.*, **209**:1, 8, 16 & 23, 1945) from the University of Pennsylvania present a study of 100 patients seen at the Metabolic Center of the medical clinic who had had diabetes for ten years or more. Observations on these patients showed that diabetes does not always progress to greater severity. After comparing the diet and insulin at the beginning and at the end of a five-year period, it is evident that the diabetes of 45 per cent of the patients had not advanced. Ten of these patients required less insulin at the end than at the beginning of the period. Of the 55 who required more insulin, a number had also received increases in diet. Acidosis occurred in three of the group during the past ten years. While arteriosclerosis was present in a number of the patients, no amputations were done on any of them. Anæmia of a mild degree was present in 26 patients. However, only 3 had less than 4,000,000 R. B. C. and less than 13·5 gm. of hæmoglobin per 100 mg. of blood. Chronic or repeated acute infections have been present in 39 patients. Of the former, cholecystitis (16 cases), pyelonephritis (9 cases), and tuberculosis (9 cases) were most frequently encountered.

Hypertension (systolic blood pressure 160 mm. Hg) was present in 38 per cent of the cases. All these were past 50 years of age; the incidence increased with each decade and was twice as common in women as men. The incidence of hypertension apparently was not dependent upon duration, control or severity of the diabetes. Only 3 (9·7 per cent) patients under 50 had abnormalities of the heart which could be attributed to their diabetic state. These were aged 24, 30, 47 years with diabetes of 15, 16 and 15 years, respectively. The low incidence of cardiovascular abnormalities in the younger group compared to similar studies in the literature on a high fat and low carbohydrate diet is suggestive evidence of the value of the high carbohydrate and low fat diet in reducing the incidence of premature cardiovascular abnormalities.

Complicated cataracts were apparently fewer in ten-year treated diabetes than in the untreated. Subcapsular "snowflake" cataracts were still found in the former. The ten-year treated diabetic has an incidence of sclerosis similar to the non-diabetic and to the diabetic of varying duration and therapy. Deep retinal hæmorrhages and exudates increase with the duration of diabetes, and may be slightly decreased by closely observed therapy. Although arteriosclerosis, hypertension, renal disease, sepsis, hyperglycæmia, may all influence the incidence of deep punctate hæmorrhages and waxy exudates, no one of them is the basic ætiological factor.

Of the 89 patients who were studied from the standpoint of arteriosclerotic occlusive disease in the legs, 3 of those under 50 years of age, and 30 of those over 50 had evidence of peripheral arteriosclerosis. Premature arteriosclerosis (below 50)

was, therefore, not common in this group of patients. The severity of the diabetes did not affect the incidence of arteriosclerosis. The adequately controlled patients had a small incidence of arterial disease. Of the females, 42 per cent had arteriosclerotic occlusive disease, as compared with 23 per cent of the males. There were no amputations in the entire group. Neuritis in the extremities was present in 31 of the 89, chiefly in those with arteriosclerosis. This much higher incidence in diabetic women than in women without diabetes parallels the greater frequency of coronary vessel disease in diabetic as compared with non-diabetic women—*U.S.O.W.I.*

The Cause of Death in Diabetes

Robbins and Tucker (*New England J. Med.*, **231**:865, 1945) present the results of an analysis of the causes of death in 307 patients with diabetes over 12 years old as determined by autopsy. For purposes of comparison, the results of autopsy on approximately 2,800 autopsied nondiabetic patients were reviewed for anatomic causes of death. Adequate histologic material was available in 268 of the patients in the diabetic group and was studied to determine the frequency of histopathologic changes in diabetes. The most frequent cause of death was pulmonary infection (25·6 per cent); cardiac decompensation and coronary occlusion follow with 12·3 per cent and 10·8 per cent, respectively. The relative frequency of fatal carcinoma is seen to be 8·4 per cent, that of acute pyelonephritis, cardiac decompensation, 7·3 per cent. Cerebral vascular disease was found to be relatively low in the scale, accounting for only 5·2 per cent of the deaths. In the control group pulmonary infection again led with 24·2 per cent. Deaths due to carcinoma were second with 14·7 per cent. Cardiac decompensation followed with 12·6 per cent, whereas coronary occlusion and acute pyelonephritis were significantly far down on the list, with 4·2 and 1·6 per cent, respectively. Evidence of cirrhosis was found in 27 of the 268 cases, the type being an alcoholic cirrhosis in 13, biliary cirrhosis in 11 and healed acute yellow atrophy in 3. Glycogen nephrosis was found in 42 per cent, benign nephrosclerosis in 55 per cent, and intercapillary glomerulosclerosis in 20 per cent. Hyalinization or fibrosis of the islets in the pancreas was found in 36 per cent. From this study, several clinical conclusions were obtained: The diabetic patient lives as long as the nondiabetic, but there are certain hazards that he is more likely to encounter, namely coronary occlusion, peripheral vascular disease, infections of the extremities and acute pyelonephritis.

Emetine in the Treatment of Eosinophilic Penumonitis

Randall (*Brit. J. Tuberculosis & Dis. Chest*, **39**:37, 1945, Ref. *Practitioner*, **155**:124, 1945) of Durban describes a case of pneumonitis with eosinophilia (Loeffler's syndrome) successfully treated by intramuscular injections of emetine. The patient was a coloured male, admitted to hospital with substernal pain of one month's duration, cough of two weeks' duration with copious purulent and blood-stained sputum, fatigue and anorexia. There were no night sweats or marked loss of weight and no personal or family history of tuberculosis. The temperature varied between 99°F. and 100·4°F. and the pulse between 70 and 100; respirations were normal. There was increased vocal fremitus and vocal resonance in the upper third of the right lung and crepitations in the right apex and mid-zone. X-rays showed what was presumed to be characteristic tuberculous infiltration of both lungs, more marked on the right side. Blood sedimentation rate was 24 mm. in one hour. Sputum was negative for tubercle bacilli, amœbæ and fungi and the stools negative for Entamoeba histolytica. Blood count showed Hb. 14·2 gm. per cent., erythrocytes 4·3 million, colour index 1·1, leucocytes 9,600, with neutrophils 74 per cent, eosinophils 6 per cent, large mononuclears 1 per cent., and lymphocytes 19 per cent. The temperature settled to normal after six days' rest in hospital; otherwise the clinical picture was unchanged. Emetine was given daily by intramuscular route in injections of .1 grain for ten days. There was a dramatic and rapid response; the patient became symptom free, the appetite improved, and x-rays taken twenty-five days after the first one showed clear lung fields. Apart from the presence of eosinophilia and the rapid improvement with emetine therapy there was no evidence of amoebic infection.

Penicillin in the Treatment of Early Syphilis

Nelson and Duncan (*Am. J. Syph. Gon. & Venereal Dis.*, **29**:1, 1945) publish this report basing on a study of six patients with early syphilis, in all of whom the cutaneous and genital lesions had shown either progression or failure to heal while under treatment with adequate amounts of trivalent arsenicals, usually combined with bismuth. The cutaneous lesions in all of the patients were of the psoriasiform type and spirochetes could be demonstrated in the material from these lesions in five of the six patients. Treatment with penicillin was carried out in a manner similar to those used in patients who had not had arsenotherapy. Dosage schedules varied from a total dose of 60,000 to 2,000,000 Oxford units. The treatment was uniformly successful in destroying surface treponemes and in healing lesions in all of these patients. Cutaneous or febrile Herxheimer reactions were observed within the first 24 hours in two patients. Spirochetes disappeared from all lesions in 10 to 26 hours after onset of treatment. On the basis of available information, it is believed that patients with arsenic-resistant syphilis should be given 2,400,000 units of penicillin intramuscularly in 60 injections of 40,000 units, each given every three to four hours, day and night.

Blood Acid Phosphatase in Prostatic Cancer

Wray (*Lancet*, **1**:783, 1945) writes that a high concentration of acid phosphatase in the blood serum more than 3·5 K.A. units per c.cm.—is generally accepted as an indicator of prostatic cancer with metastasis and a concentration as high as 10 K.A. units is regarded as diagnostic of that disease, though occasionally prostatic cancer may be present inspite of a normal concentration in the blow serum, specially if metastasis has not yet occurred. This determination of blood acid phosphatase is also a means of controlling hormonal treatment of prostatic cancer. It has been shown by Huggins and Hodges that injections of testosterone propionate cause a rise in the acid phosphatase level in the cases with bone secondaries due to prostatic cancer and this is an excellent help in the differentiation of a malignant prostate from a benign hyperplasia. In cases of prostatic cancer showing anæmia, the sedimentation rate and acid phosphatase must fall to within normal limits before a rise in the hæmoglobin can be expected.

Penicillin and Sulphonamides in Urinary Disease

Davis (*Lancet*, **1**:593, 1945) at a meeting of the section of urology of the Royal Society of Medicine on "Penicillin and the Sulphonamides in Urinary Disease" reviewed the present position of sulphonamide therapy

in urinary infections under (1) indications, (2) basic principles in their use, (3) dosage and mode of administration, and (4) complications and their treatment. He preferred sulphathiazole in acute and cronic coliform infections, but it was not effective in infections with Bacillus proteus and Streptococcus fæcalis, and its value in staphylococcal infections was doubtful. There a large initial dose the drug should be given four-hourly day and night for at least 2 days, after which dosage was gradually reduced. A white cell count should be done before treatment was begun, and repeated on alternate days. Fluid intake should be 5 pints daily to ensure a urinary output of at least 2 pints. Alkalis were given because the sulphonamides were most effective and more soluble in an alkaline medium. There need be no restriction in the diet. He favoured doses of 1·0 g. four hourly, the tablets being crushed and given in an alkaline mixture. Dosage, intake, and output of fluid should be charted daily. Complications which might occur were drug sensitivity (*e.g.*, drug-rash and drug-fever), granulocytopenia, and oliguria or anuria from blockage of urinary outflow in the kidney itself or in the ureters. The symptoms and treatment of this last complication were fully discussed. Large doses of alkaline fluid should be given at the oliguric stage; massage in the knee-elbow position, ureteric catheterisation, use of the speaker's uretral cork-screw, or nephrostomy were the methods recommended for anuria.

Cruickshank emphasised the value of laboratory control in the use of penicillin. In administration there was a tendency to return to intermittent intramuscular injections: doses of 15,000-20,000 units 4 or 5 times a day were effective in the more localised infections. The staphylococcal kidney abscess, which might be multiple or coalesce to a renal carbuncle or lead to perinephric abscess, was very suitable for penicillin therapy. It was usually secondary to a focus elsewhere and had been common at the end of the 1914-18 war when chronic osteomyelitis was prevalent. Staphylococcal cystitis, often a low-grade infection due to the white staphylococcus and very resistant to other forms of therapy, might also respond to penicillin. Treatment of staphylococcal infections should continue for some time after clinical cure, because of the tendency to relapse. Although the organism responsible for the commoner urinary infections—coliform bacilli, proteus, pyocyaneus and Str. fæcalis were classified among the penicillin-resistant bacteria, penicillin was greatly concentrated in the urine, so that, with a daily dosage of 100,000 units, concentrations of 30 to 40 units per c.cm. were obtainable. Helmholtz and Sung in America had lately shown that Str. fæcalis was inhibited *in vitro* by a concentration of 3 units of penicillin per c.cm. of urine at pH 7·6, B. proteus by 8 units, and coliform bacilli by 15-30 units, B. ærogenes and pyocyaneus resisted concentrations over 30 units per c.cm. Thus penicillin might prove beneficial in urinary infections due to proteus and Str. fœcalis which resisted sulphonamide therapy. Non-specific urethritis and abacterial pyuria might also respond to penicillin. From experience in the treatment of gonorrhœa, systemic rather than local penicillin therapy was indicated in these infections.

In the discussion that followed, a number of speakers referred to the failure of sulphonamides in chronic urinary infections, and the need to deal with the local infective foci: and emphasis was laid on obstructive factors or atony which led to urinary stasis. Prophylatic sulphonamides had proved very useful in preventing fever and infection following instrumentation. Sulphamezathine was recommended as less toxic and more soluble than sulphathiazole. Anuria need not be due to mechanical obstruction. The tendency to secondary infection with pyocyaneus and coliform bacilli after penicillin therapy was common experience. It was doubted if a high urinary concentration of penicillin would reach the infeeting organisms in the mucous membranes, but penicillin would not be inactivated by associated acid or alkali treatment since it was effective over a range of pH 5 to 8.

Storage of Skin for Autogenous Grafts

Mathews (*Lancet.*, **1**:775, 1945) writes that the use of stored skin has been adopted as a means of reducing the number of operations required in grafting a large raw area.

Experimental work has been done on the method of storage, and the macroscopic and microscopic appearance of the skin after storage. Tissue-culture has demonstrated the power of growth of the cells of stored skin.

The use of fibrin instead of stitches to fix the skin is advocated under some circumstances to obviate the necessity for an anæsthetic.

The results of the first fifty grafts of stored skin are reviewed.

There is a possible relationship between refrigeration and an increase in the power of the skin to withstand infection by some organisms.

Observation on the Treatment of Empyema with Penicillin

Blades *et al* (*Surgery*, **17**:572, 1945) basing on their observations, suggest a tentative working plan as follows: That an injection of intrapleural penicillin be given as soon as infected fluid appears in the pleura. It is important that local treatment be withheld until the organisms in the fluid are identified. This precaution will prevent waste of penicillin in infections which do not respond to the drug. An initial positive bacteriologic diagnosis will also rule out the possibility of a tuberculous effusion or empyema which may deserve consideration if no other bacteria are found.

If systemic penicillin has not been employed during the pneumonic stage of the disease, it should be combined with the local therapy. It might be argued that by the time an empyema becomes evident the pneumonic phase of the disease will have subsided and, therefore, systemic administration of penicillin would be superfluous. Florey and Cairns have emphasized the advantages of combined administration of penicillin in severe war wounds. The chief advantage of the systematic route is that the blood will contain a bacterial inhibitory substance which may control a spreading cellulitis or invasive infection. It is the authors' opinion that the same principle is sound in the management of pneumonia complicated by empyema. This is particularly true in cases of streptococcal or staphylococcal empyema.

Probably three injections of 50,000 units of penicillin on alternate days are sufficient for local treatment. Before the penicillin is injected into the pleura, as much pus or infected fluid as possible should be removed by thoracentesis. If pus continues to form and thicken, surgical drainage should be established. A sterile empyema is not a cured empyema, and evacuation of frank pus should not be unduly delayed because organisms cannot be found after the penicillin treatment has been started. These investigators' experiences confirm the statement included in the report of the Committee on Chemotherapeutic and Other Agents, Division of Medical Sciences, U.S. National Research Council, by Keefer and his associates,

namely, that even when the pus in an empyema cavity is sterilized by penicillin it often becomes so thick that thoracostomy is necessary to furnish adequate drainage.

As an adjuvant to skilful surgery, penicillin has already revolutionized the management of many surgical diseases of the thorax. In their excellent paper on "Major Complications of Penetrating Wounds of the Chest," D' Abreu, Litchfield, and Hodson give a brilliant account of the value of the mould both as a prophylactic and as a therapeutic agent. There is every reason to predict that with "penicillin protection" the dangers of practically all operations upon the chest will be reduced. This communication is not intended to deprecate the value of the remarkable agent, but to emphasize that it will not afford protection from violations of the fundamental principles of surgery—*U.S.O.W.I.*

Pregnancy and Diabetes

Bigby and Jones (*Brit. M.J.*, **1**:360, 1945) write that the diabetic risks to the mother are ketosis and hypoglycæmia, particularly in labour and the early puerperium. Increased liability to toxæmia is also another important risk. Diabetics tend to produce fat and post-mature infants; premature death of the fœtus *in utero* may occur, particularly if pregnancy is allowed to continue to term; hydramnios, neonatal death from fœtal hypoglycæmia caused by overdevelopment of the pancreas *in utero* are also likely to occur; fœtal abnormalities are said to be more frequent than usual. *Diabetic management* in pregnancy comprises a high carbohydrate intake, (the renal threshold for sugar excretion is lowered during pregnancy and large amount of glucose, *e.g.*, 50 to 150 gm. may be lost in the urine) and the regulated use of insulin judged by blood sugar readings. During labour the usual diet is given as long as possible and then glucose (lactose) 15 to 20 gm. 2-hourly and an extra 30 gm. at the onset of the second stage. The muscular effect of labour reduces the insulin requirements and there is real danger of hypoglycæmia; the dosage must be reduced. If there is heavy ketosis extra glucose should be given. After delivery less insulin is needed as a rule, and a satisfactory working arrangement is to give half the usual amount on the following day and build up the dose, if necessary. *Obsteric management.* Premature delivery at 36 to 37 weeks is advisable because of the risk of fœtal death *in utero* near term and of mechanical difficulties due to overlarge babies. The methods available are either cæsarian section or surgical induction of labour. *Management of the baby.* For the first few hours after birth the babies were given glucose one teaspoonful in ½ ounce of water 2-hourly to try to prevent hypoglycaemia. This was given 3-hourly for the next day or two and the infants were breast fed or given expressed breast milk as soon as possible.

The use of Local Penicillin in Ophthalmia Neonatorum

Sorsby (*Brit. M. J.*, **1**:903, 1945) records the results, obtained by the local use of penicillin in a further series of thirty-eight cases of ophthalmia neonatorum. The method adopted was as follows:—A swab for smear or culture was taken on admission and then the eye irrigated with half normal saline at room temperature. A drop of adrenaline, 1 in 1,000 was instilled, and a scraping taken for examination, atropine being instilled if the cornea is involved. Accumulated pus was wiped away, one drop of penicillin in a concentration of 2,500 units per c.cm. instilled, and the baby returned to its cot. The instillation of penicillin was continued every five minutes until all discharge had disappeared, then half-hourly for a further twenty-four hours. The five minute applications usually occupy half an hour to three hours (6 to 30 applications); the half-hourly instillations about six to twelve hours. No irrigation is needed, any thin mucoid discharge being ignored or, if clinging to the lids, wiped away with moist pledgets of cotton-wool. In twenty-five cases in which this method was carried out only two failed to respond; five required a second course, and in the remaining eighteen clinical cure was obtained within an average of just under ten hours. The remaining thirteen cases of the thirty-eight of the series were treated with penicillin drops at one-hourly intervals for six hours, then two-hourly for twenty-four hours, and finally at three-hourly intervals. All the infants responded well but in one case relapse occurred after a lapse of five days. Both these cases cleared up after a course of sulphamezathine.

22ND ALL-INDIA MEDICAL CONFERENCE

The following office-bearers were elected at a meeting of the Reception Committee of the Conference which is to be held in Amritsar by the end of December, 1945:

Chairman—Dr. H. F. Maneckshaw.
Senior Vice-Chairman—Dr. Chunilal Bhatia.
Vice-Chairmen—S.B. Dr. Sohan Singh, Dr. Amir-ud-Din, R.S. Dr. Het Ram Aggarwal, Col. Amir Chand (Lahore), Dr. R. S. Sharma (Ferozepore), Dr. Chowdhari Mohammad Nawaz (Lyalpore).
Hony. General Secretary—Dr. Faqir Chand Shori.
Hony. Joint General Secretary—Dr. R. K. Malhoutra.
Hony. Organising Secretary—Dr. Sain Das Vohra.
Assistant Organising Secretaries—Drs. Jugal Kishore Nayyar, Ram Lal Khorana, Imtinan Ilahi.
Scientific Committee:—*Chairman*—Dr. Manmohan Singh. *Secretary*—Dr. Balbir Chand Bhandari.
Exhibition Committee:—*Chairman*—Capt. Dr. M. S. Segat. *Secretary*—Dr. Harbhajan Singh.
Accommodation Committee:—*Chairman*—Dr. Bodh Raj Nanda. *Secretary*—Dr. Monohar Lal Kapur.
Finance Committee:—*Chairman*—Dr. R. K. Malhoutra. *Secretary*—Dr. Bhagwan Singh Uppal.
Publicity Committee:—Dr. Ishar Das Bhatia. *Secretary*—Dr. Fakhar-ud-Din.
Entertainments Committee:—*Chairman*—Dr. Sujindar Singh. *Secretary*—Dr. R. P. Malhoutra.
Sanitation Committee:—*Chairman*—Dr. S. Rozdon, M.O.H. *Secretary*—Dr. Gian Singh.
Resolutions Committee:—*Chairman*—Dr. B. L. Kapur. *Secretary*—Dr. R. C. Goulatia.
Members of the Executive Committee:—Dr. B. L. Kapur (Lahore), R.S. Dr. S. N. Kaul (Lahore), Dr. K. L. Pathak (Ludhiana), Dr. Gurmukh Singh (Tarantarn), Dr. Baldev Singh, Dr. (Miss) S. Bhatia, Dr. Shanti Sachdeva, Capt. Dr. Tulsi Das, Dr. Anup Singh, R.S. Dr. Guran Ditta Kapur, Dr. Fakhr-ud-Din, Dr. Manohar Lal Chopra.

Hall Gate
Amritsar

Faqir Chand Shori
Hony. General Secretary
22nd All-India Medical Conference

NOTES AND NEWS

ALL-INDIA OBSTETRIC & GYNAECOLOGICAL CONGRESS

The IV All-India Obstetrical and Gynaecological Congress is going to be held in the end of December, 1945 at Lahore. The subjects fixed for discussion are:—Puerperal Sepsis, Pelvic Inflammation and Antenatal Care.

BOMBAY MEDICAL COUNCIL

Registrar, Bombay Medical Council gives the following summary of the precept for information: Attention of all registered medical practitioners included in the constituency described by Section 2 (*z*) (*c*) of the Bombay Medical Act, 1912, whose names are borne on the Medical Register on 30-8-1945 is invited to the notification regarding election of a member to the Bombay Medical Council in the vacancy caused by the death of Dr. Sir Mangaldas V. Mehta—published in the Bombay Government Gazette and the Sind Government Gazette of 30th August, 1945. Thursday the 20th September, 1945 is the last date for receiving nominations of candidates. Copies of the notification and other necessary information in respect of the bye-election can be had from the office of the Council.

ORISSA COUNCIL OF MEDICAL REGISTRATION

The Berhampore Branch, Indian Medical Association at a meeting held on 25-7-45 passed the following resolution:

"It is proposed to request the Government of Orissa to nominate one of the members of this Association in the vacancy that will arise in the near future on the Orissa Council of Medical Registration, Cuttack, as has been done on the previous occasion."

UNITED PROVINCES MEDICAL COUNCIL

The following are excerpts from the minutes of the meeting of the United Provinces Medical Council, held in its office at Lucknow, March 22 and 23, 1945.

It was decided that, since her address is not known, the name of Dr. Tarabai Kelavkar, L.R.C.P.S., be erased after a period of six months from the date on which the notice sent to her had been received back undelivered, and the case against her be taken up if her address becomes known in the meantime or when she applies for restoration of her name to the medical register.

The case against Dr. Indra Narain Saksena, L.M.P., was considered and, after examining the witnesses and hearing the counsel for both the sides, the Medical Council unanimously judged Dr. Indra Narain Saksena, to have been guilty under section 26 of the United Provinces Medical Act and directed the Registrar to erase his name from the medical register.

The following resolution was referred to the Standing Committee for careful consideration and redrafting. Captain H. N. Shivapuri, M.B., B.S., I.M.S., (retired) to be co-opted to the Standing Committee for the consideration of this matter.

"This Council recommends to the Provincial Government and through it to the Government of India that the practice of quackery is increasing daily in the country and as the Indian (Medical) Degrees Act (Act VII of 1916) and United Provinces Medical Registration Act (Act III of 1917) have failed in their purpose of protecting the practice of scientific medicine, the necessary legislation on the following lines be undertaken as early as possible:

(*i*) It should be a penal offence to use the prefix "Doctor" or Dr. by any one unless he possesses either a degree of doctorate from a recognised university or a medical qualification registrable by the Indian Medical Council or one of the Provincial Medical Councils or both.

(*ii*) It should be a penal offence to use suffixes and or prefixes simulating recognised medical degrees or diplomas.

(*iii*) It should be a penal offence for anyone to practise scientific system of Medicine (Allopathy) unless he holds a medical qualification registrable by either the Medical Council of India or by any one of the Provincial Councils or both."

The following resolution was passed:

"Resolved that this Council recommends to the Government to request the universities to give practical shape to the recommendation of the Director General of Indian Medical Service in letter no. 5-Demob./43—P. II., dated March 8, 1944, on the basis of the resolution adopted by the Medical Council of India at its meeting held on October 23, 1943 to this effect at the earliest because it has been observed that non-intermediate licentiates serving in the military department are being refused admission to medical colleges of the United Provinces for the short courses of M.B.B.S., so kindly facilitated to them as contemplated in the above recommendation."

U.P. PROVINCIAL MEDICAL CONFERENCE

The Hony. Provincial Secretary, U. P Provincial Branch, writes that the XI U.P. Provincial Medical Conference will be held at Saharanpur on Friday and Saturday, October 26 & 27, 1945 under the Presidency of Dr. Jawahar Lal, M.L.A. of Cawnpore. All members in U.P. are requested to take keen interest particularly in the Scientific Section and are also requested to write papers and to come and read them in the Scientific Section of the Conference. The Organising Secretary of the Conference is Dr. S. C. Banerji, M.D., 'Sunny View', Saharanpur, from whom all information regarding the Conference can be obtained and to whom all communications in this connection should be addressed.

SCABIES IN BENGAL

Kenneth Mellanby, SC.D., Member of the Medical Research Council, Typhus Unit, S.E.A.C. India in publishing a report on his observations on Scabies in Bengal in *Indian M. Gaz.*, **86**:296, 1945 gives the following conclusions:

(1) The majority of patients are suffering from true scabies *i.e.* from infection with *Sarcoptes scabiei.*

(2) This condition is widespread. The majority of destitutes show signs of present or recent infection, and a similar state probably exists in a wide section of the population.

(3) Although Sarcoptes is the caustive organism, it is difficult to find live mites. This is because they are present in very scanty numbers, not because, they are difficult to find in pigmented skin (where present they are easily recognized).

(4) Most patients have been infected for years, and have developed a substantial immunity to Sarcoptes, hence the small numbers of parasites. But due to the widespread existence of the disease, over-crowding and the warm moist climate (resembling a permanent 'inbed' microclimate re-infection constantly occurs, and these hypersensitive individuals give a maximum reaction.

(5) I saw no individuals who had developed any tolerance to Sarcoptes.

(6) The widespread skin lesions are almost entirely secondary to the scabies. It is possible that malnutrition plays a part here. Some dermatitis is due to over-treatment with sulphur (usually accompanied by active scabies in healthy, untreated skin on other parts of the body).

(7) When the scabies is cured and re-infection prevented, the secondary lesions can be cured also.

For future action it would be impracticable to try to set up clinics as in Britain to treat all cases and then families. The problem is a vast one, made even greater by difficulties due to caste and social custom.

In a previous communication (Mellanby, *Brit. M. J.*, **7**:38, 1945) the author referrd to a soap known as 'tetmosol' soap that has been produced for the treatment of scabies. If we could insure that all concerned used it, the disease would soon be eliminated. At present, however, poverty prevents the widespread use of any kind of soap.

In India, people not only wash but also rub oil into the skin, covering the entire surface of the body daily. If this oil could be suitably modified it might be used to eliminate scabies. A small percentage of tetmosol might be incorporated in oil used for washing purposes or perhaps one or two per cent of 'mitigal'.

In my view, since the people of this country are so familiar with rubbing oil on the skin, it would be best, if possible, to try to incorporate any scabies remedy in this medium.

Readers of this article will, probably be interested to learn that I have referred the mattter to the Public Health Commissioner with the Government of India and also to my authorities, the Medical Research Council in the United Kingdom. I would express the tentative view that it is probable that, here in India the end of the scabies epidemic is approaching on account of the rise in immune population resulting from the widespread outbreak, but it must be remembered that if the disease slowly decreases in extent a non-immune population will again arise. In any event, efforts made at the present stage to control the incidence of scabies will greatly accelerate the natural decrease in the number of victims.—*Indian M. Gaz.*

MEDICINAL PRODUCTS FROM ORISSA

The report of the "Industrial Survey of Orissa" by H. B. Mohanty (1945) states that the cultivation of cinchona plants is being tried in the Jeypore Estate in the district of Koraput, and something like a thousand trees have been planted as an experimental measure. The Forest Department of the estate is trying to increase the area under plantation. By the older process the plants were allowed over five years to mature before extraction of quinine from their barks could be taken up. The new Russian experiment of extracting quinine from one year old cinchona trees ought to be given a trial as India's requirement of quinine is very much greater than the present production. Considering the wide prevalence of malaria, and its injurious effects upon the people, the question of increasing the production of quinine is an urgent one. If the experiment of growing cinchona trees in the Koraput district proves to be a success, it might be possible for the Province to get all the quinine she needs within her own boundaries.

It is also desirable to set up the necessary plant to extract strychnine from the seeds of nux vomica which grows abundantly in many parts of Orissa, and the neighbouring States. All the nux vomica now grown in Orissa and in Orissa States are exported.

The Fisheries Department of the Government of Orissa, prepared last year more than 100 gallons of shark liver oil from the sharks caught off the Orissa coast and found that it would be possible to prepare the oil on a commercial scale and market the product at a reasonable price to compete with cod liver oil. It is now left to the business organization to develop the industry on a commercial scale. When the industry develops, further benefits will accrue by utilizing the by-products such as shark skins and flesh. Shark skin yields fine soft leather and shark flesh could be utilized for manufacturing fish glue.

No attempt has been made to extract the active principle found in *Vitex peduncularis, Cassia berina and fistula, Andrographis paniculata, Adhatoda vasica, Saraca indica, Datura factuora* etc., for medicinal use. These plants grow wild and in abundance in Orissa. When a chemical and pharmaceutical industry is started in Orissa, he innumerable herbs, and medicinal plants found in plenty in Orissa will provide valuable raw materials for preparing syrups, alcoholic extracts, and tinctures, etc.—*Science & Culture.*

A NEW PH.D. IN ANATOMY

The University of Edinburgh has honoured Dr. Sushil Kumar Basu, M.SC., M.B., D.T.M., D.P.H., Lecturer, Carmichael Medical College, with the degree of Ph.D. on a thesis on "Comparative studies in the growth in length of limb bones with special reference to the union of epiphyses". He is the first medical graduate in India to receive such an honour.

Dr. Basu has been a teacher in Anatomy since 1921 and had acted as a demonstrator in the same subject in the University of Edinburgh. He has published his researches on the "Determination of Age in Bengalee Girls" which have been appreciated. With the help of a Ghosh Travelling Fellowship awarded to him by the Calcutta University in 1939, he travelled through U.K., U.S.A., Japan, etc., carrying on his own researches while studying the methods of teaching and research in the medical sciences, with special reference to anatomy. While in U.K. and U.S.A., he had the honour of being invited to deliberations of the Anatomical Society of Great Britain and Ireland and the Association of American Anatomists.

DR. H. DE SA SILVER JUBILEE PRIZE

The Bombay Obstetric & Gynæcological Society has selected 'Uterine Hæmorrhages in Gynæcology' as the subject for the thesis for the above prize for 1945-46:

The prize is open to all medical practitioners of not more than seven years' standing and registered with Bombay Medical Council. Last date for receiving the thesis is 15th March 1946.

COLLEGE OF PHYSICIANS & SURGEONS, BOMBAY

Out of eleven candidates who appeared at the D.G.O. Examination held in August 1945, the following eight have passed:—

Kanta Apaji Amin (Miss), Shukumari Rabecca Banwar (Miss), Prabhakar Shankar Bhagvat, Chimanlal Mohanlal Kamdar, Khairunissa Begum Mir Ahmed Ali (Miss), Dattatraya Krishna Kothurkar, Dhun Novroji Pavri (Miss) and Saran Abdulkadir Siddiki (Miss).

Telegram—INMEDICI, CALCUTTA. *This Issue Exceeds 8,500 Copies.*

ST. JOHN CRERAR LIBRARY DEC 26 1945

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

ESTD. 1928 INDIAN MEDICAL ASSOCIATION

Editor: KUMUDSANKAR RAY, M.A., B.SC., M.B., CH.B. (EDIN.), F.S.M.F., M.L.C. (BENGAL)
Assistant Editors: B. P. NEOGY, M.B., M.R.C.P. (LOND.), M.R.C.S. (ENG.)
B. P. TRIBEDI, M.B., D.B. (LOND.), F.N.I.
Secretary: ANILKUMAR CHAKRABARTY, M.B.

Volume XIV CALCUTTA, SEPTEMBER, 1945 Number 12

In the Management of Peptic Ulcers

The Absorbent Antacid

MAGSIL

B.C.P.W. Brand Magnesium Trisilicate Co. Tablet

CONTROLS GASTRIC ACIDITY, ACTION SUSTAINED.

PROTECTS INFLAMED MUCOSA WITH SILICA-GEL COATING.

ABSORBS FERMENTATIVE TOXIC PRODUCTS OF INDIGESTION.

ACTS AS A CARMINATIVE AND MILD LAXATIVE.

Available in Bottle of fifty tablets

Literature on Request

BENGAL CHEMICAL & PHARMACEUTICAL WORKS LD.

CALCUTTA :: :: :: BOMBAY

Association Office
Hindusthan Buildings, Calcutta.

Annual Subscription
Inland Rs. 9/- Foreign 15s. or $5

INDON	VITAMINS AND VITAMIN COMPOUNDS	MADE FROM AMERICAN MATERIALS	TABLETS OF GUARANTEED PURITY AND PROPER CONCENTRATION
VITAMINDON B COMPLEX B_1 5 mgs. B_2 2 ,, B_6 1 ,, NICOTAMIDE 30 ,, YEAST 200 ,,	VITAMINDON B_1 MILD 1 mg.	VITAMINDON B_1 MEDIUM 5 mgs.	VITAMINDON B_1 STRONG 10 mgs.
VITAMINDON B_1 CONCENTRATED 20 mgs.	VITAMINDON B_1 EXTRA 50 mgs.	VITAMINDON B_2 RIBOFLAVIN 3mgs. PER TAB.	VITAMINDON B_6 PYRIDOXINE 5mgs. PER TAB.
VITAMINDON C ASCORBIC ACID 50 mgs.	VITAMINDON D CALCIFEROL 2500 I.U.	VITAMINDON E TOCOPHEROL 5 mgs.	VITAMINDON K NAPHTHOQUINONE 10 mgs.
NICOTINDON P-P FACTOR NICOTINIC ACID 50 mgs.	NICAMIDINDON NICOTINIC ACID AMIDE 50 mgs.	YEASTINDON YEAST TABS. REINFORCED BY VITAMINS B_1, B_2, NICOTINIC ACID	FORTINDON B_1, B_2, C, D, NICOTINIC ACID, ARSENIC, CALCIUM, MANG., NUX VOMICA
MULTI-VITAMINDON B_1 5 mgs. B_2 2 ,, C 30 ,, NIC. ACID 30 ,,	TONIC 'INDON' LIQUID IRON-VITAMIN B COMPLEX-GLYCEROPHOSPHATES	THE HOUSE OF VITAMINS IN INDIA	INDO-PHARMA PHARMACEUTICAL WORKS BOMBAY 14.

PENICILLIN "P. D. & Co."

(SODIUM SALT.)

Penicillin, at first manufactured in almost negligible quantities, is now a standard therapeutic agent in the treatment of infections due to certain gram-positive organisms including the Streptococcus, Staphylococcus, Pneumococcus, also Gonococcic and Meningococcic infections.

Since then, production of Penicillin has increased considerably, with the result that ample supplies are now available, and medical practitioners can unhesitatingly prescribe Penicillin in all suitable cases.

Parke, Davis & Co's Penicillin is offered in rubber-diaphragm-capped vials containing 100,000 Oxford units.

When prescribing, specify P. D. & Co.

Parke, Davis & Co.

Fissured Nipples

●

Hæmorrhoids

The non-narcotic local anaesthetic ointment which alleviates pain and pruritus for many hours.

●

Simple Burns

●

Pruritus Ani et Vulvae

NUPERCAINAL

Further information on request from:

CIBA (India) LIMITED

Pharmaceutical Department

P. O. Box 479 - BOMBAY

*"THIAZAMIDE SODIUM"

BRAND SULPHATHIAZOLE SOLUBLE

Indications

1. Incapacity to take sulphathiazole by mouth due to vomiting or other cause.
2. The necessity in the treatment of severely ill patients of obtaining an adequate blood concentration with greater rapidity than is possible by the oral route.
3. Failure to obtain adequate blood concentration by oral administration because of poor absorption from the gastro-intestinal tract.

Adequate supplies available in:
Boxes of 6 ampoules
" " 25 "

M & B

* TRADE MARK

MAY & BAKER LIMITED

Distributed by MAY & BAKER (INDIA) LIMITED

479A

ANTISEPSIS

Unfailing, Safe and Painless

'Dettol . . . is a halogen derivative of 'xylenol, which is dissolved in aromatic essential 'oils and is miscible with water in a perma-'nently stable emulsion. It differs from most 'of the antiseptics in common use in that its use 'in concentrated form is not prohibited by 'toxic effects—for example, it is well tolerated 'on the naked hands day after day, or on the 'vulva, or even on the intact vaginal mucous 'membrane, and yet a 1 per cent. solution very 'rapidly kills hæmolytic streptococci and *B. coli*, 'even in the presence of pus. Its bactericidal 'activity is very little diminished by mixture 'with soap. It has a pleasant smell. Our ex-'perience with it at Queen Charlotte's both in 'the labour wards and in the isolation block, 'has been very satisfactory.'*

This was written ten years ago when 'Dettol' was first introduced to the British medical profession. Within three years the incidence of haemolytic streptococcal infections at Queen Charlotte's Maternity Hospital, Hammer-smith, London, had fallen by over 50 per cent. and this dramatic decline was authoritatively attributed to the use of 'Dettol', which was the only change made in the anti-septic procedure.† Today, this antiseptic is preferred before all others in British hospitals and homes.

There can be no frontiers to the advance of medicine. The vast clinical experi-ence in the use of 'Dettol', published in scientific papers and in standard text-books, has inevitably influenced medical opinion and practice throughout the British Empire, where in the great majority of maternity hospitals 'Dettol' is now helping to win the unremitting campaign against puerperal sepsis. And it is becoming increasingly evident that the unique combination of qualities which make 'Dettol' the antiseptic of choice in obstetrics must also com-mend its use in all the contingencies, medical and surgical, which call for unfailingly effective, safe, painless and pleasant antisepsis.

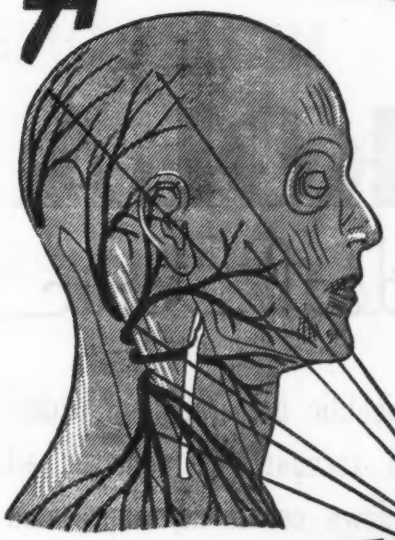
M. 15

RECKITT & SONS, HULL AND LONDON, ENGLAND

* Colebrook, L. (1933) *Brit. med. F.*, **2**, 725.

† Colebrook, L. (1936) *F. Obstet. Gynæc.*, **43**, 601.

A PRIZED FORMULA



Consisting of Calcium Glycerophosphate, Sodium, Potassium, Manganese, Iron and Strychnine in exactly right proportions.

Alembic

NERVITONE

THE MOST EFFECTIVE NERVE TONIC

Calcium, Potassium and Sodium in combination with Glycero-phosphates supply the mineral constituents so often found deficient in our daily diet, or depleted by wasting diseases. Iron and Manganese supply the blood-forming constituents when there is anaemia and loss of blood, and Strychnine provides the initial bucking up.

INDICATIONS: Most effective in cases of nervous and sexual debility, low vitality, muscular fatigue and mental or physical exhaustion during convalescence from any illness.

ALEMBIC CHEMICAL WORKS COMPANY, LIMITED BARODA

Standard's VINKOLA

An Ideal Tonic

A scientific preparation of exceptional recuperative value in all run down conditions, depression and debility and an ideal sustainer during periods of stress and strain

COMPOSITION

Nux vomica, Kola-nut extract, Cinchona, Aromatic bitters, Glycerophosphates, Iron, Calcium, Sodium, Potassium and traces of Copper and Manganese.

Alcohol 30 per cent proof.

SPW

STANDARD PHARMACEUTICAL WORKS LTD.
CALCUTTA

CALCUTTA POLYCLINIC LTD.,
ESTD. 1923

6-A, Surendranath Banerjee Rd.,
Calcutta.

HAEMOCALCIN

Calcium with liver extract and
Vitamin B complex and C

An ideal combination for calcium therapy

ARSENOFIL

For Filariasis.

ALBULACTIN

For non-specific protein therapy.

CONTENTS

Takata-Ara Reaction in the Diagnosis of Hepatic Cirrhosis —M. NARAYAN PAI, M.B.B.S. 291
Chemical Determination of Vitamin C Sufficiency in India —S. RAM, M.A. (CANTAB.), F.R.I.C. 294
Observations on Renal Function in Anæmias —N. N. GUPTA, M.D. 297
A New Sodium Antimony Gluconate for the Treatment of Kala-Azar —S. K. GHOSH DASTIDAR, M.B. (CAL.), M.R.C.P. (LOND. & EDIN.), D.T.M. (CAL.) 298
Sulphonamide Chemotherapy for Intestinal Antisepsis —S. RAJAGOPALAN, M.SC., A.I.I.SC. 300
Whole Blood Therapy: Its Past and Present —M. ABDUL HAMEED, M.D., M.R.C.P. (LOND.) .. 301
Tuberculosis—A Disease of Society —H. G. D. MATHUR, B.SC., M.B., D.T.M. & H., M.R.C.P.(E.), DR.P.H. 303
Problems of Filariasis with Reference to Post-War Planning in India —N. AHMAD, F.R.F.P.S. (GLAS.), L.M. (DUB.), M.B.B.S. (BOM.) 306
Scabies —V. GOBINDAN NAIR, M.R.C.P., F.R.F.P.S. (GLAS.) .. 309
Editorial
Nutritional Factor in Cirrhosis of Liver 316
Current Medical Literature 317
Notes and News 321
Association Notes .. .. .. lv—lxvi

HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-

FOR EXPECTANT AND NURSING MOTHER

Horlicks—modified milk—is an excellent food. It has a high anti-ketogenic value and taken regularly prevents and relieves morning sickness. A doctor writes: "My patients, while suffering from sickness during pregnancy, find Horlicks of the greatest help to them."

In the experience of many physicians and nurses, Horlicks when included in the diet of nursing mothers increases the flow of breast milk. Tests also show that it stimulates blood regeneration in nutritional anæmia. As a doctor has said: "Its quite radical effects in the case of anæmic persons must be seen to be appreciated."

HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-HORLICKS-

LESCO

GALENICALS

Safely

commended to

THE MEDICAL PROFESSION

Our Prices are always Cheap
Consistent with Quality

• VITOSTROL

Vitamins A & D concentrate containing Vitamin A 12,000 I.U. and Vitamin D 2,000 I.U. per c.c.

Richer than Cod liver Oil.

Anti-infective and Growth-promoting.

Available in 10 c.c. Phials.

• BRONTON

Effective Cough cure

containing

Ext. Ipecac. liq., Ext. Senega liq., Ext. Scillæ. liq., Ext. Pruni Virg. liq., Tr. Pipali Co., Glycyrrhizin., Ephedrine Hydro., Pot. Guacol-Sulphonate, Syrup, Aromatics, etc.

Available in 5 fluid oz. bottles.

• ADRENOLEUM

Adrenalin in Oily base

For Prolonged and Sustained action of Adrenalin.

Only for intramuscular therapy.

Available in 1 c.c. & ½ c.c., 6 amp. boxes.

• LESCODOMIDE

Sulphanilamide Ointment c̄ Cod liver Oil.

Outstanding Application in Streptococcal Infections assuring growth of healthy granulation-tissue.

Available in 1 oz. Phials.

LESCO

Literatures on Request.

Lesco Chemical Works Ltd.

BHARAT BUILDINGS LAHORE

Be it . . .

① *Indisposition*

② *Critical stage*

③ *Convalescence*

HI-NUTRON

is your Stand-by..

HI-NUTRON—The original "ampule-idea" of storing pure, concentrated and unadulterated Essence of chicken. Most easily assimilable protein food which provides immediate energy. Leaves no residue and does not irritate the digestive system. Being prescribed daily in military and civilian practice all over the country and the middle east.

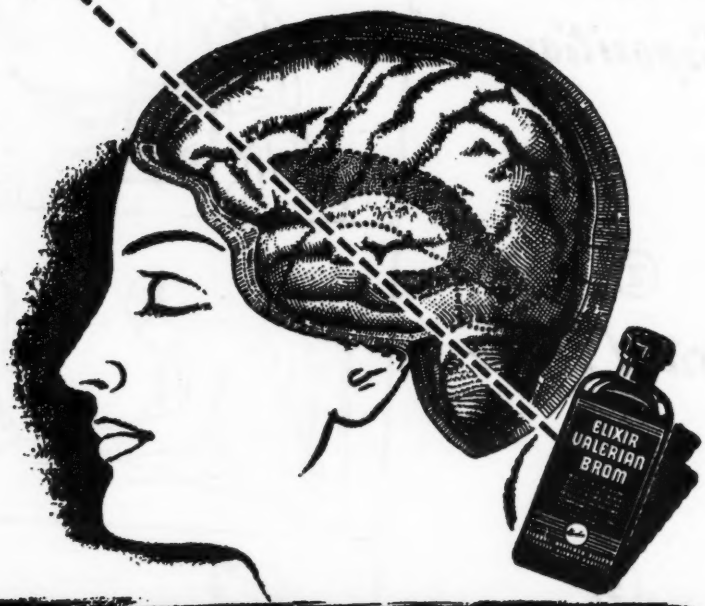
Keeps fresh indefinitely in sterilized ampules of 5 and 10 cc. Samples and literature on request.

HIND CHEMICALS Ltd. CAWNPORE

Distributors for:

Bombay Branch: Lucknow Branch: Punjab: Delhi: Sind & N. W. India:

★ FREE FROM TOXIC DANGERS



Elixir Valerian Brom

More effective than ordinary bromides and not so dangerous as the latest powerful hypnotics of the Barbital group, Elixir Valerian Brom is highly useful in Neurosis, Epilepsy, Hysteria, Infantile Convulsions, Painful Menstruation and headaches, chronic alcoholism and all nervous disorders of functional character.

Alembic

COMPOSITION.

Pot. Bromide	15 grs.
Chloral Hydrate	8 „
Tinct. Valerian	8 Mlns
Tinct. Cannabis Indica	1 „
Tinct. Hyoscyami	4 „
Tinct. Auranti	1 „
Ext. Glycyrrhizae	1 „
Syrup	Sufficient.

ALEMBIC CHEMICAL WORKS COMPANY LIMITED, BARODA

Introducing

PENICILLIN
SODIUM

With an established value in the field of military medicine and surgery, Penicillin is now freely available for the treatment of civilian cases.

In rubber-stoppered aluminium-capped bottles of 100,000 Oxford Units.

Further information supplied on request.

BURROUGHS WELLCOME & CO.
(The Wellcome Foundation Ltd. Incorporated in England)
COOK'S BUILDING, HORNBY ROAD,
BOMBAY

In all Emergencies!

Iodochlor

THE ORIGINAL DIHALOGEN ANTISEPTIC

Ideal for

LOCAL, GENERAL & INTERNAL USE

UTILITY PACKINGS

2 & 4 Ozs

ALLIED DRUG

CALCUTTA

Issued by **ALLIED DRUG INDUSTRIES, LTD.**

Chief Sales Office, 2, Mission Row, Calcutta.

SIMILAC

THE ACCEPTED PRODUCT OF INFANT-FOOD RESEARCH THAT HAS AMAZING SIMILARITY TO BREAST MILK ★

SIMILAC has the same nutritional qualities as breast milk, and numerous clinical tests have proved its superiority over ordinary milk preparations in digestibility, weight and tissue building qualities and freedom from gastro-intestinal troubles.

Accepted by the *American Medical Association* as the only milk food that approximates breast milk physically, chemically and metobolically and exclusively prescribed by physicians and Pediatricians in the U. S. and elsewhere.

NOW AVAILABLE AT LEADING STORES

Write for Literature to Sole Distributors for India

THE FAIRDEAL CORPORATION LTD.,

LAKSHMI BUILDING, - SIR PHIROZSHAH MEHTA ROAD, - FORT, - BOMBAY.

FC. 13.

Products of Bathgate's Laboratories

CHINIOFON B. P. (YATREN) Powder and solution.

CARBARSONE: Capsules and Tablets in bottles of 20.

SULPHARSPHENAMINE: Tested both chemically and biologically to conform to the International Standard. Issued in the following strengths, 6, 12, 18, 24, 30, 36, 42, 48, 54 and 60 centigrammes.

CARBANTIM: The Carbamide derivative of p-aminophenyl Stibinic Acid for Intravenous injection in Kala-azar. Ampoules of 0.025, 0.05, 0.10, 0.15 and 0.20 gm.

Bathgate & Co.
CHEMISTS CALCUTTA

NEO-LIVACON

The Liver Extract.

It provides all the hæmatopoietic factors of the liver. Also the hæmatinic Minerals and Vitamins in their natural state. The value of Neolivacon in anæmia cannot therefore be underrated. Neolivacon is administered intramuscularly.

2 c.c. ampoules & 10 c.c. R/C vials.

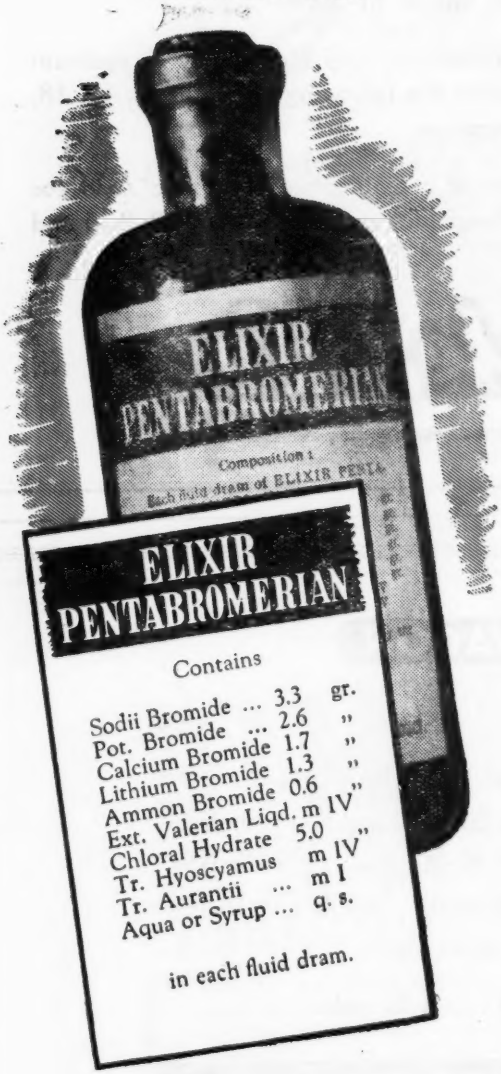
UNION DRUG CO. LTD. CALCUTTA.

285, BOWBAZAR STREET,

T'Phones:—
Cal. 1159.
Cal. 4975.

T'Gram:—
"Benzoic" Cal.

A SCIENTIFIC COMBINATION OF NERVINE SEDATIVES, HYPNOTICS AND ANTI-SPASMODICS IN A PALATABLE FORM



A BIRLA LABORATORIES PRODUCT

Sales Office :
64, Pathuriaghat Street, Calcutta.

Indispensable

SYELSI

Acid Butter Milk

Milk defatted and Acidified by Lactic Acid culture and Carbohydrate contents readjusted has rendered SYELSI ACID BUTTER MILK a specific Milk Food during Summer, Green and Teething Diarrhœa of Infants. May also be used after Typhoid in habitual constipation and when ordinary Milk is not tolerated.

HONEY CREAM

A mixture of Carbohydrates in different stages of digestion along with sugar obtained from different sources. Highly palatable and suitable for all particularly the babies as a supplement to milk.

THERAPEUTIC LABORATORIES,

68|1-B, SIKDARBAGAN STREET,
CALCUTTA.

'Phone : B.B. 5822. 'Gram : "SYELSI".

DOCTORS HOSPITALS DISPENSARIES

Obtain your supplies from direct Importers and Manufacturers of the following. We receive regular consignments from our office in U. K. and thereby can guarantee quality goods at moderate rates.

INJECTIONS

Liver Extract. Emetin Hydrochloride. Digitalin and Strychnine. Atropine Sulphate. Sodium Cacodylate. Ephedrine Hydrochloride, etc., etc.

TABLETS

Calcium Gluconate. Calcium Lactate. Yeast. Vitamin B_1. Sulphanilamide. Sulphaguanidine. Sulphadiazine. Aspirin, Phenacetin and Caffein, etc.

DRUGS

Phenazone. Chlorodyne. Sodium Salicylate. Potass Bromide. Acriflavin. Potass Citrate. Homatropin Hydrobrom. Mercurochrome, etc., etc.

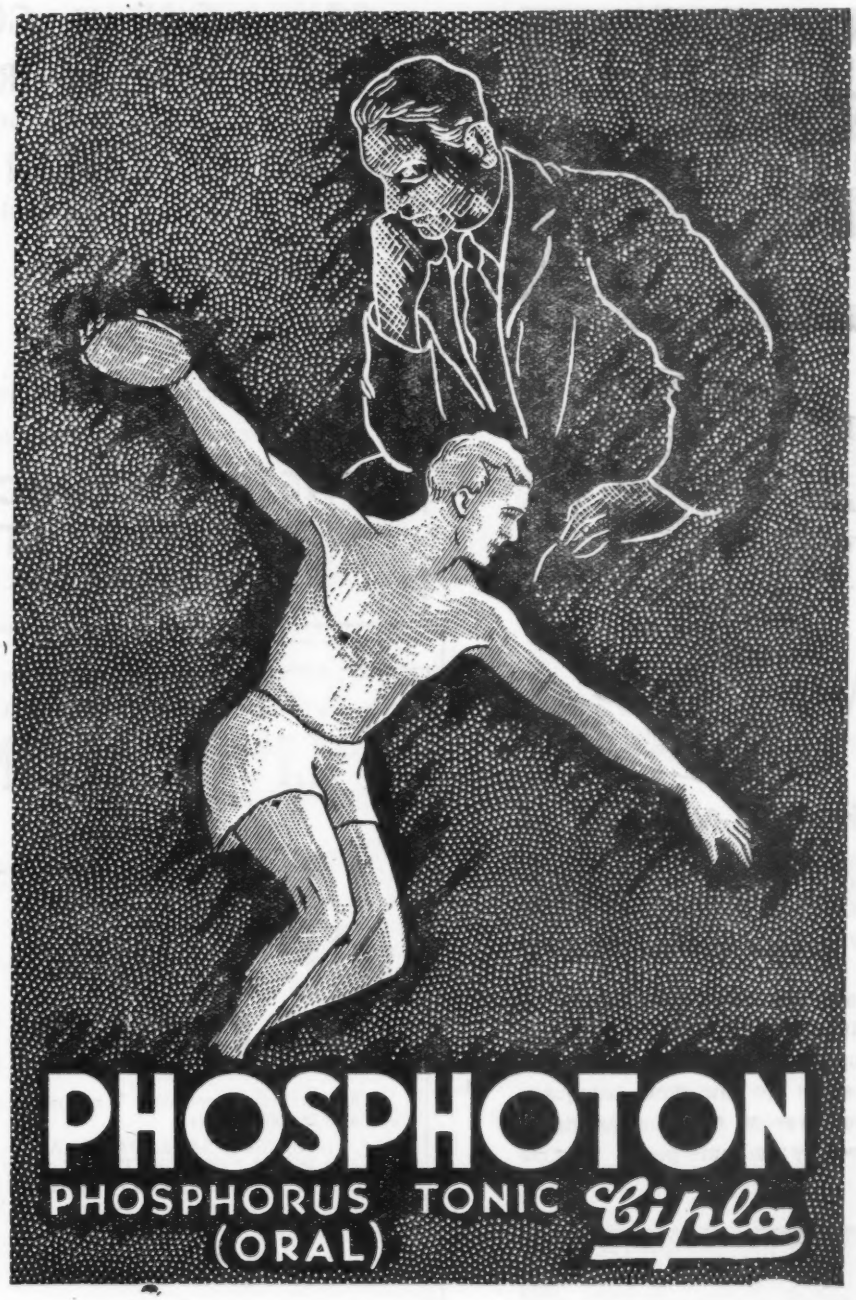
SURGICAL SUNDRIES

Adhesive Plaster (Zinc Oxide). Record Syringes. Rubber Surgical Gloves. Clinical Thermometers. Rubber Stethescope tubing, etc., etc.

We shall be pleased to furnish complete Price List on application. Write to:—

CROYDON CHEMICAL WORKS,

47, Alli Chambers,
Medows Street, Fort, BOMBAY.


PHOSPHOTON
PHOSPHORUS TONIC
(ORAL)
Cipla

In this new emergency package

increased supplies of

DEXTROSOL

are now available

Pleased are the distributors of DEXTROSOL to be able to announce that supplies of this valuable therapeutic agent are now more adequate. For the present the familiar tin is replaced by an emergency wartime pack.

CORN PRODUCTS CO. (INDIA) LTD.
P. O. BOX 994, BOMBAY.

RAYCALCIN

RAYCALCIN with GOLD

RAYCALCIN with IRON

(Injections in 5 c.c. and 3 c.c. packings)

SYRUP RAYCALCIN (oral)

Advance Therapy in Tuberculosis

FILARSEN

Specific for Filariasis

POLYTONE

A Unique Restorative & Tonic Preparation

Ask for Descriptive Literature from—

THE POLYCLINICAL LABORATORY LTD.,

1, MOTI SEAL STREET, CALCUTTA.

——An Advance Therapy in TUBERCULOSIS——

LIVO-CALCIN

(*Intramuscular*)

(Plain and With Gold)

A superfine combination of Calcium Gluconate, Liver Extract, Hormones, Choline, Vitamin B Complex and C.

SYRUP LIVO-CALCIN

(for Oral Use)

SARSARIN

An excellent rejuvenating Tonic and Blood-purifier, available in four forms:—

(*i*) IODISED SARSAPARILLA.
(*ii*) WITH LIVER EXTRACT & IRON.
(*iii*) WITH GLYCEROPHOSPHATES & STRYCHNINE
(*iv*) WITH GOLD.

QUIN-TONE

A grand specific for MALARIA and an ideal Hæmatenic Tonic.

PEARL CHEMICAL INDUSTRIES,

85, Belgachia Road, Calcutta.

The Doctor's Choice in Tonics

HEMO-DRAKSO-MALT

differs from other tonics in its composition and action....

The stimulating combination of blood-forming haemoglobin, glycero-phosphates and assimilable iron in Hemo-Drakso-Malt is further reinforced by pepsin, juice of choicest grapes and malt extract made from barley which immediately restore and strengthen digestion impaired by long illness.

That's why eminent medical men prescribe Hemo-Drakso-Malt in all wasting diseases of men, women and children, such as anaemia, tuberculosis, rickets, scurvy etc., and as a general tonic during convalescence after debilitating illness.

ALEMBIC CHEMICAL WORKS COMPANY, LIMITED, BARODA

PECTOKAB

For Gastro INTESTINAL disorders

COMPOSITION PER FLUID Oz.

PECTIN equivalent to	½ oz. of Raw Apple
KAOLIN	90 grs.
TINCTURE BELLADONNA	8 minims.
VEHICLE	q.s.

INDICATIONS:

Childrens' Diarrhœas, Gastro-Enteritis, Chronic Enteritis, Fermentative and Putrefactive Dyspepsia, Diarrhœa and Dysentery.

DOSAGE:

1 to 2 tablespoonfuls twice or more times a day, depending upon the severity of the case. For children and infants in proportion.

Available at all chemists in bottles of 6 ozs. and 16 ozs.

STRYCHEMET (AMPOULES)

For Amœbic DYSENTERY Cases

COMPOSITIONS :

EMETINE HYDROCHLOR.	½ gr.
STRYCHNINE	1/60 gr.
AMPOULE WATER	1 c.c.

INDICATIONS:

Amœbic Dysentery, Amœbic Hepatitis, Bilharziasis, Guinea Worms and Oriental Sores. Also in Alcoholism and Morphinism.

The use of Strychnine in STRYCHEMET counteracts the fall of blood pressure, serves as an anti-depressant and also acts as a circulatory and respiratory stimulant.

STRYCHEMET can therefore be used with impunity in Cardiac and Respiratory cases complicated by Amœbiasis.

Available at all Chemists

Further details will be furnished on request.

CHEMO-PHARMA LABORATORIES LIMITED.

King's Lodge, Lamington Road, Byculla, Bombay.

Agents for:

S. M. C., Carnatak, Kerala and Mysore State.
McKENSONS, Post Box 4533, BOMBAY 8.

Delhi :
Messrs. RANBAXY & CO.,
Post Box No. 104, New Delhi.

The dosage of

'M & B 693'

TRADE MARK BRAND

sulphapyridine

in gonorrhoea

The common practice is to give 4 grammes (8 tablets: 2, 2, 2, 2) during the first twenty-four hours of treatment, and to continue with 3 grammes daily (6 tablets: 2, 1, 1, 2) until 16—25 grammes have been given.

In Adult males this dosage is reported as adequate without any adjuvant lavage. Where a smaller dosage is employed—2 grammes (4 tablets: 1, 1, 1, 1) daily for seven to ten days—it seems desirable to combine irrigation with chemotherapy. Where institutional treatment is possible a more intensive dosage can be practised, keeping the patient in bed, administering a minimum of six pints of fluid daily, and giving 20 grammes of the drug in a forty-eight hour's course of treatment.

Adult women may receive 2 or 3 grammes daily for one week; where the gastric tolerance is poor the patient may be instructed to take ½-tablet every two hours throughout the day, with a first morning dose of 1 tablet and a last evening dose of 1½ tablets.
After an interval a second course should be given, preferably contemporaneous with the next menstrual period.

In young infants after a first dose of ½ tablet (0.25 gramme) subsequent doses of 0.125 gramme should be given every four hours for five days. It is customary to powder the drug and suspend it in milk to which has been added a pinch of bicarbonate of soda.

Young girls may receive ½—1 tablet (0.25—0.50 gramme) four times a day for four days, followed by a second course of treatment after an interval of one week.

The manufacture and sale of this product is protected by Indian Patents Nos. 25912, 26671, 26672 and 27447 (May & Baker Limited) *and by corresponding patents in many other countries.*

Distributed by MAY & BAKER (INDIA) LIMITED

FERARCHIN

AN UNIQUE REMEDY FOR

MALARIA AND OTHER TROPICAL FEVER

In the light of Recent theory, ORIENT LABORATORY has introduced in the market a Malaria Remedy, FERARCHIN. Besides Quinine it is incorporated with all the essential factors necessary for effectively combating *Tropical Fever* and has its action on sexual and asexual term of Parasites. Ferarchin is unfailingly efficacious in combating recurrent attacks of fever in most Quinine-resistant cases. Ferarchin remedies Anæmia, reduces the size of the liver and spleen to normal. It is available in solubles, *Mixture & Tablet* form. All of them possess the same therapeutic efficacy It is the safe preparation for *peroral & parcuteral* administration.

Ferarchin Mixture.

Each Adult dose (2 Fl. Drams) contains:—	
Quinine Hydro and Cinchona Alkaloids	Grs. 5
Ammon Chloride/Nux Vomica	Grs. 5/Grs. 1/5
Iron & Arsenic	Grs. 1 & 1/125
Oil Clove. Cinnamon	m 5

Ferarchin Tablet.

Each Tablet contains the following:—		
Quinine Hydro.	Grs.	2½
Arrhenal	„	½
Ext. Nux Vomica	„	⅛
Ferri Reduct and Hæmatin	„	½
Aloin	„	⅛
Ext. Belledona	„	⅛
Alstonia	„	1

Ferarchin Ampoules

Ferarchin.	Quinine 5 grs.	Organic Salt of Iron	1 gr.
		„ „ „ Arsenic	1/100
		Urethane	q.s.
Ferarchin (Strong)	Quinine 10 grs.	Organic Salt of Iron	1 gr.
		„ „ „ Arsenic	1/100
Ferarchin (Special)	Quinine 2½ grs.	„ „ „ Iron	1 gr.
		„ „ „ Arsenic	1/100
		Strychnine Hydro	1/125
		Urethane	q.s.

N.B.—Never use Ferarchin where Arsenic is contraindicated

For detailed information please communicate with

THE ORIENT LABORATORY LTD.,

With which is incorporated

MEDICAL RESEARCH LABORATORY,

12-A, B, C, Musalmanpara Lane, Calcutta.

AOLAN

for

NON-SPECIFIC PROTEIN THERAPY

THE ORIGINAL AOLAN
IS MADE BY

HERTS PHARMACEUTICALS LTD

WELWYN GARDEN CITY, HERTS.

DIENOESTROL–BOOTS

A NEW SYNTHETIC OESTROGEN

Dienoestrol is the name approved by the General Medical Council for γδ-bis-4-hydroxyphenyl-△βδ-hexadiene, a new and highly active oestrogenic substance which is closely related to Stilboestrol and Hexoestrol (Synthovo). Clinical results have shown that Dienoestrol when given orally is probably the most potent synthetic oestrogen so far produced and it is considerably less toxic than other synthetic compounds.

Reports to the Therapeutic Trials Committee of the Medical Research Council have proved the value of Dienoestrol in menopausal disorders, and for inhibition of lactation using a smaller dosage than is usual with Stilboestrol. No patients experienced nausea or vomiting.

Supplied in tablets of 0.1 mg. and 0.3 mg. for oral administration only.

For particulars Boots *please apply to*

BOOTS PURE DRUG COMPANY LIMITED

P.O. Box 2070 CALCUTTA | P.O. Box 680 BOMBAY | P.O. Box 158 Br. COCHIN

Manufactured by

BOOTS PURE DRUG CO. LTD NOTTINGHAM ENGLAND

GLOBIN INSULIN

(with Zinc)

—BOOTS—

Globin Insulin (with Zinc)—Boots has a rapidity of onset and duration of effect intermediate between Insulin and Protamine Zinc Insulin. Its action lasts about twenty-four hours and with a slight modification of diet most cases of diabetes mellitus can be controlled by one injection a day.

Globin Insulin (with Zinc)—Boots is available as a clear aqueous solution of insulin combined with globin, with the addition of a trace of zinc chloride to the mixture.

5 c.c. rubber-capped vials
40 Units per c.c.
80 Units per c.c.

For particulars Boots *please apply to*

BOOTS PURE DRUG COMPANY LIMITED

P.O. Box 2070 CALCUTTA | P.O. Box 680 BOMBAY | P.O. Box 158 Br. COCHIN

Manufactured by

BOOTS PURE DRUG CO. LTD NOTTINGHAM ENGLAND

NATURE
PROVIDES FERMENTS
For
DIGESTION
of
FOODS

BI-
DIASTASE
Helps
WHERE
NATURE
FAILS

· BI-DIASTASE ·

- BI -
DIASTASE
(LIQUID)
For Hyper-Acidity: Dyspepsia due to Carbo-hydrate Indigestion.

- BI -
DIASTASE COMPOUND
(LIQUID)
For Dyspepsia, Flatulence, Hyper-Acidity, Heartburn, Carbohydrate, Protein and Fat Indigestion.

- BI -
DIASTASE COMPOUND
(TABLETS)
For Dyspepsia, Flatulence, Hyper-Acidity, Heartburn, Carbohydrate, Protein and Fat Indigestion.

•• BI-ALKAZYME ••

An Excellent Preparation for all sorts of digestive troubles such as Flatulence, Hyper-Acidity, Vomiting of Pregnancy, Gastric and Duodenal Ulcers.

BI-DIASTASE
AND
BI-ALKAZYME
are prepared from Purely Vegetable Sources.

ALWAYS
POTENT
IN
ACTION

FOR
LIQUEFYING
THE FOOD
To a Disgestible Form.

Obtainable of all good Chemists everywhere.

'Phone: Cal. 358 & 359 } **THE BENGAL IMMUNITY Co., Ltd.** { 'Gram: "Injectule" Cal

153, DHARAMTALA STREET, CALCUTTA

Albert David's

palatable energizer and restorative

SIOTONE

contains carefully selected ingredients which promote tissue-building, stimulate regeneration of the nervous system, correct mineral deficiencies, and assist normal metabolism by their highly nutritive, detoxicating, and mildly laxative action.

Composition: Glycerophos. of sod., pot. and mang.; ferr. and ammon. citr.; cupr. glucon.; strychn. hydrochl., nuclein. acid; vit. B. compl., extr. of grapes, dates, figs.

ALBERT DAVID LTD.

Head Office: 15, Chittaranjan Avenue CALCUTTA

BRANCH OFFICES:

"Gupta Mahal", Church Gate Reclamation, BOMBAY. 2/27, Broadway, MADRAS.

ANOTHER CONTRIBUTION TO CHEMOTHERAPY

ENTERO-QUINO

Iodochloroxyquinoline

A specific chemotherapeutic agent
For the treatment of acute and chronic Amœbic Dysentery
and Intestinal Amœbiasis.

Prepared for the first time in India in our Research Laboratory.

Issued in
Tubes of 20 tablets
of 0·25 gm. each.

For further particulars please write to:

EAST INDIA PHARMACEUTICAL WORKS LTD.
TOLLYGUNGE: CALCUTTA

"PLOI"

1. CONCENTRATED ESSENCE OF CHICKEN

An easily assimilable protein food, having a high nitrogen content. It leaves no residue and is an ideal form of protein administration to the diseased, weak and the convalescent.

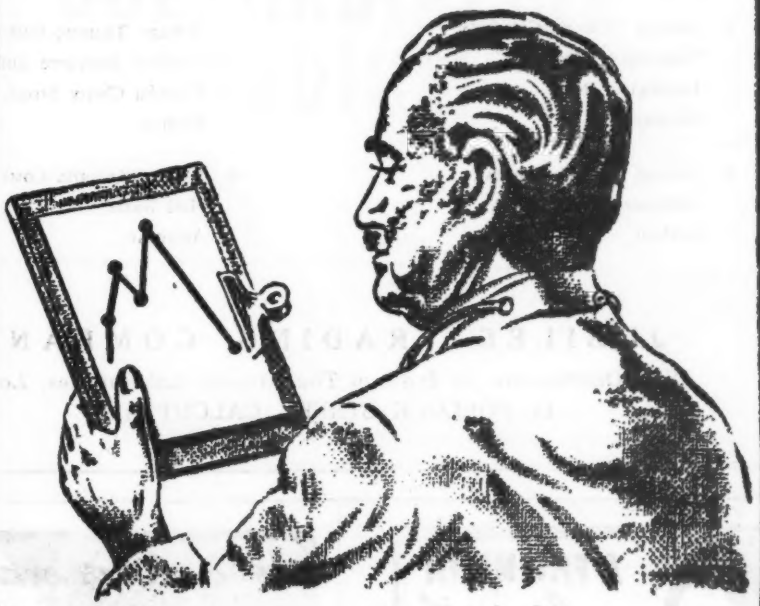
2. QUINO-CINTONA

(A specific for Malaria)

Latest findings show that Chatim (Alstonia) if combined with a very small quantity of Quinine, has a far better and prolonged action than Quinine alone.

Quino-Cintona is a Chatim-Quinine combination for the treatment of benign and malignant malarias.

PHARMACEUTICAL LABORATORIES OF INDIA, LTD.
133, UPPER CIRCULAR ROAD, CALCUTTA.



Non-Specific Immune Therapy

1 to 2 cc. OPSODIN subcutaneously or intramuscularly in **fevers of obscure etiology and all infectious diseases like influenza, pneumonia, tonsillitis, etc.** brings down the temperature rapidly and cuts short the course of the disease by **stimulating the natural defensive forces of the body.**

OPSODIN

Cipla

CHEMICAL, INDUSTRIAL & PHARMACEUTICAL LABORATORIES Ltd.
BOMBAY—8.

We are pleased to inform our medical and pharmaceutical friends that we have opened branches in Bombay, Madras, Karachi and Amritsar and the addresses are given below; our branch office will appreciate your inquiries concerning any of the products listed in our catalogue; please also note that till further notice the inquiries of Madras and Amritsar should be sent to our Head-Office at Calcutta.

1. JUBILEE TRADING COMPANY,
"Lamington Chambers",
Lamington Road,
Bombay, 4.

2. JUBILEE TRADING COMPANY,
"Andhra Insurance Building",
Thambu Chetty Street,
Madras.

3. JUBILEE TRADING COMPANY,
Mahatma Gandhi Road,
Karachi.

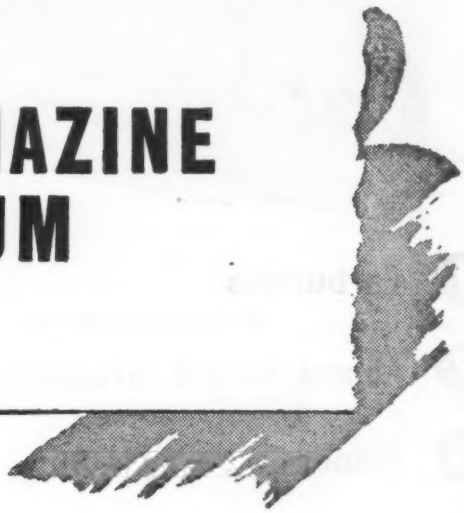
4. JUBILEE TRADING COMPANY,
Hall Bazar,
Amritsar.

JUBILEE TRADING COMPANY

(Sole Distributors for India of The Armour Laboratories, London)
14, POLLOCK STREET, CALCUTTA.

DELHI DEPOT.
Iswari Niwas Shop No. 1
Behind IMPERIAL BANK, Chandni Chauk.
DELHI.

SULPHADIAZINE SODIUM



BANKS, in his recommendations on dosage of Sulphadiazine, states :
"The best 'loading' dose *is an intravenous injection*. This is indicated in all severe infections. If it is impracticable, an equivalent of slightly higher amount should be given orally."

Banks, H. S. (1942) " The Treatment of Infective fevers." — 'Practitioner.'

In grave and acute infections, initiate therapy by the parenteral route with one or two injections, and then continue Sulphadiazine orally.

Adequate supplies available in Boxes of 6 × 4 c.c.

Distributed by

MAY & BAKER (INDIA) LIMITED

478 A

Carbuncles

1. **Carbuncles** *operated and unoperated*
2. **Abcess, boils & furuncles**
3. **Glands & other swellings**
4. **Pelvic inflammations**
5. **Mastoiditis & Arthritis**
6. **Erysipelas & cellulitis**

MAG-MAG ..is your answer!

MAGMAG incorporates *exsiccated* magsulph and glycerin with phenol in a paste form convenient for applications.

The strong hygroscopic action of **MAGMAG** renders it a very useful preparation for *drawing out* toxins, pus and fluid from the affected part, thus relieving congestion and pain. Application of **MAGMAG** separates slough from wounds, disinfects and aids healing.

Sample & literature on request.

HIND CHEMICALS LTD.
CAWNPORE

Bombay Branch :
6, PHIROZSHAH MEHTA ROAD
PHONE : 24285

Punjab :
KISHAN CHAND & Co. Ltd.
ANARKALI, LAHORE

Distributors for :
Delhi :
LAMB BROS.,
P. O. BOX 111

Sind & N. W. India :
LAMB BROS.
SUNDER ROAD, KARACHI

Alembic

EPHEDRINE HYDROCHLORIDE

(AMPOULES & TABLETS)

Alembic Ephedrine Hydrochloride has earned for itself a place in every physician's armamentarium by proving itself most effective wherever it is indicated—viz. in Hay-fever, Bronchitis, Asthma, Whooping Cough, Urticaria, Coryza, etc.

ALEMBIC CHEMICAL WORKS COMPANY LIMITED, BARODA

AL. 203

CARIPEPTIC LIQUID

Standardized Enzymes of Carica Papaya with Diastase

Caripeptic Liquid contains in palatable, stable and active form, the proteolytic, amylolytic and rennitic enzymes of Carica Papaya, fortified as to starch digesting power by the addition of diastase. It affords in one prescription a vegetable digestant, plus the carminative and psychosecretory factors necessary in successful treatment.

Caripeptic Liquid is a pronounced carminative. When it is taken after a meal, the immediate subjective effect is a sensation of gastric stimulation; the sense of well-being and comfort spoken of by pharmacologists in describing carminatives. This carminative phase is frequently soon succeeded by evidence of active digestive action apparent in subsidence of the feeling of oppression or discomfort occurring in dyspeptic subjects.

AVAILABLE IN BOTTLE OF SIXTEEN OUNCES

Manufactured by:
The Upjohn Company
KALAMAZOO-MICHIGAN, U.S.A.

Sole Agents:
T. M. Thakore & Co.,
43, Churchgate Street
FORT, BOMBAY.

Branches:
12, DALHOUSIE SQUARE, EAST, CALCUTTA.
AHMEDABAD — KARACHI — LAHORE — POONA — MADRAS
NOVA-GOA—RANGOON—DACCA—TRICHINOPOLY—DELHI.

EVERYTHING FOR A DOCTOR

Record syringes 2 5 10 20
Sup. Eng. Rs. 12|12, 16|-, 18|12, 23|12
All glass Rs. 8|-, 12|8, 16|8, 21|-
Needles Rs. 5/4 Doz. Glass MT. Rs. 8/8 Doz.
Cholera apparatus Rogers Rs. 19/8
Saline apparatus 300 c.c. Rs. 10/-, 500 c.c. 14/-
Stethoscope AVONSCOPE Rs. 14/8, Sup. tube Rs. 2/- yd.
Hæmocytometers Improved Neuber complete Double chamber Rs. 69/- Single chamber Rs. 55/-
„ spare chamber Rs. 59/- „ Rs. 44/-
„ „ Eng. Neuber or other Single Rs. 33/- and Double Rs. 46/-
„ spare cover Glass U.S.A. Rs. 2/8
„ pipette Rs. 4/14
Hæmometer Sahlis U.S.A. Rs. 95/-
Blood sedimentation pipette Westergeen Rs. 5/4
„ stand for above for 3 Rs. 5/- for 6 Rs. 8/8
Kahn's Test outfit complete Rs. 42/-
Widal Test outfit complete Rs. 9/4

ZILL & CO.

PRINCESS STREET BOMBAY No. 2.
Ref: 33 *Lists on request*

Insist on:

IMMUNO'S

Syrups: Easton's Syrup, Syrup Vasaka, etc.
Liquid Extracts: Ext. Kurchi, Ext. Kalmegh, Ext. Chhatim, etc.

&

LIVER TONIC

Ask for Samples, price lists and other particulars.
Products of

Immuno Chemical Laboratory Ltd.,
79, PUDDAPUKUR ROAD, BHOWANIPUR,
CALCUTTA.

PHONE- B.B.5656 *Doctors recommend!*

SREEMANY'S PALM SUGAR CANDY

-FOR-
COUGH
COLD &
ASTHMA

INVENTER:- KAVIRAJ BOLAI CH SREEMANY
AGENTS:- B.K.PAUL. M.BHATTACHARYA.

Highly recommended by:—
Dr. B. C. Roy, M.D. (CAL.), M.R.C.P. etc., Major M. G. Naidu, M.B., Hyderabad (Dn.), Dr. Nalini Ranjan Sen Gupta, M.D., Dr. Bamandas Mukerji, M.B., Dr. Sunduri Mohan Das, M.B.

Office—132, Baranasi Ghose St., Calcutta.

PHONE:- CAL.5539

VITONE

TONIC WINE
(SUBSTITUTE)

Insure youth *with* VITONE

METROPOLITAN CHEMICAL INDUSTRIES LTD.
14. BENTINCK STREET. CALCUTTA.

Agent:—**S. B. JAMAL & Co.,** 17A, General Patters Road. Mount Road, **Madras.**

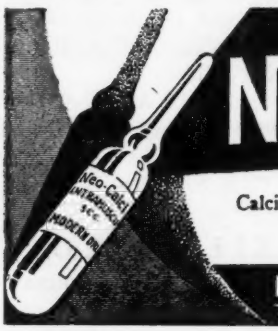
A QUICK REMEDY FOR

FILARIA

ARSENO-TYPHOID

For
Filarial Scrotum, Legs, Hands, Weeping Breasts & Every Form of
FILARIASIS
Particulars free from

CALCUTTA CLINICAL RESEARCH
6, CHOWRINGHEE ROAD, CALCUTTA.



Neo-Calcin

INTRAMUSCULAR

Calcium, Choline with Liver Ext. Vitamin B Complex & C.
Demand more result in all Calcium treatment.
For Particulars Apply to:—

MODERN DRUG HOUSE
72 B. ASHUTOSH MUKHERJEE ROAD - CALCUTTA.

Free Samples to Profession on request.

NAVARATNA PHARMACEUTICAL LABORATORIES

OFFER

SYRUP PERTUSOL

Composition:—

Ex: Pitvan	3	grs.
Indian Nightshade	3	„
Gainari	3	„
Ephedra Vulgaris	3	„
Syrup Ajowan	3	mins.
Syrup Vasaka add	1	dr.

For the effective treatment of Whooping cough Acute and Chronic Bronchitis.

ELX: GYNÆ CO.

Composition:—

Ext. Lodh Liq.	10	mins.
Ext. Mootha	6	„
Ext. Ashoka	15	„
Ext. Beriberris	5	„
Ext. Viburnum	6	„
Nigalla Sativa	4	grs.
Woodfordia	4	„
Water Lilly	4	„
Syrup Calcii add	1	dr.

For the effective treatment of Menorrhagia, certain forms of Dysmenorrhœa & Amenorrhœa.

AND STANDARDIZED LIQUID EXTRACTS OF SELECTED INDIGENOUS DRUGS

Detailed Catalogue regarding our products may be had from our Medical representatives or from Head Office, Cochin.

Our products are available at all leading Chemists.

NAVARATNA PHARMACEUTICAL LABORATORIES

Post Box No. 13, MATTANCHERRY P.O.
(COCHIN)

PRODUCTS OF THE BRAHMACHARI RESEARCH INSTITUTE

Two most recent treatments of **AMŒBIC DYSENTERY**

ARSAMBIDE
(Carbarsone)

Purest *p*-Carbamino-Arsanilic Acid *B.R.I.* Low Toxicity. Most powerful Specific in the treatment of **AMŒBIC DYSENTERY.** It has destructive action on both the cystic as well as the vegetative forms of *Entamœba histolytica.* Supplied in tablets of 0·25 grm. each.

QUINAMBICIDE
(Iodochloroxyquinoline)

A most potent agent for the treatment of acute, sub-acute and chronic **AMŒBIASIS.** A prompt and sure specific. Supplied in tubes of 20 tablets of 0·25 grm. each.
Literature supplied on request.

The most recent treatments of **SYPHILIS** and **YAWS**

THIO-SARMINE

Purest Sulpharsenobenzene *B.R.I.* A trivalent arsenical prepared *for the first time in India.* Low toxicity, cheap in price, most powerful specific. Each carton of **THIO-SARMINE** contains a free ampoule of **SARSO-SOLVENT** for intramuscular injection. Supplied in doses of 0·075 grm., 0·15 grm., 0·30 grm., 0·45 grm., 0.60 grm.

A new bismuth preparation for the treatment of **SYPHILIS**

ACTI-BISMUTH

Purest Ultra-Bismuth in Colloidal Suspension *B.R.I.* Painless intramuscular injection. Supplied 6 ampoules in a box of 1 c.c. each. One ampoule contains 1 c.c. of 5% Suspension, representing 0·05 grm. Bismuth Metal activated.

The most recent treatments of **BACTERIAL INFECTIONS**

SULPHO-CIDINE

Para-amino-benzene Sulphonamide, B.R.I. in tablets for oral administration. Purest Sulphanilamide *B.R.I.* Available in 0·5 grm. or seven and a half grains in each tablet.

SULPHO-CIDINE
(ALBUM) *B.R.I.* **Injectable**

A new soluble sulphanilamide product Colourless injectable chemotherapeutic agent for the treatment of Strepto, Staphylo and Gonorrhael infections by subcutaneous, intramuscular and intravenous routes. Obtainable in packings of 2 c.c. solutions in 3, 6, and 12 ampoules in a box.

The most efficient treatments of **KALA-AZAR**

UREA STIBAMINE
(Brahmachari)

Remarkably beneficial results obtained by its use within the shortest time. To be administered intravenously. Supplied in doses of 0·01 grm., 0·025 grm., 0·05 grm., 0·10 grm., 0·15 grm., 0·20 grm. in separate carbons.

NEO-STIBENE
A product

For children with thin veins and other cases in which it is difficult to give **UREA STIBAMINE** (Brahmachari) intravenously, use **NEO-STIBENE** intramuscularly. Dissolve in **STIBO-SOLVENT** given free in each carton. Supplied in doses of 0·01 grm., 0·025 grm., 0·05 grm., 0·10 grm., 0·15 grm.

THE BRAHMACHARI RESEARCH INSTITUTE

82/3, CORNWALLIS STREET, CALCUTTA.

WAR AND INVENTION

Inspite of all its horrors and calamitis with the loss of Millions of lives the present war, has also rendered the new inspiration of scientific research, and so far the Indian Drug Industry is concerned it has achieved the remarkable progress, our

neo-Iron

(IRON for INTRAVENOUS or INTRAMUSCULAR USE)

is also a fruitful result of such sincere investigation in the original line and we have the pleasure to announce that we are pioneer to prepare the iron preparation suitable for the intravenous use. *Particulars from:—*

ADCCO LIMITED
KALIGHAT, CALCUTTA

PURE VENOMS

COBRA	ORANGE SPIDER
VIPERS	CUBAN SPIDER
RATTLESNAKE	RED ANTS
BLISTERING FLY	HONEY BEE

Available in Therapeutic doses in 1 c.c., 2 c.c. ampuls.

Descriptive Booklet free to the Medical Profession only.

LEXIN LABORATORY
MIHIJAM E. I. R. (SP).

Specialities for the MEDICAL PROFESSION

ASOK CORDIAL:—(*a*) *with Vitamins and Hormones and* (*b*) *with Valerian, Bromide and Vitamins.*—A general uterine tonic and alterative in chronic uterine disorders of both structural and functional origin.

ANETONE:—(*with or without Strychnine*).—A palatable and readily assimilable blood forming tonic for primary and secondary Anæmia.

ASWARIN:—A composition to tone up the central nervous system in a short time.

DIGESTIN:—A digestive elixir and tonic for dyspepsia, weakness and auto-intoxication.

BILITONE:—A liver tonic, cures biliary dysfunctions. It restores the liver to its normal functions.

QUINOGEN:—An ideal combination of anti-malarial and anti-anæmic tonic principles of indigenous and western extraction for the treatment of malaria.

Special reference is made to the high quality of I.C.T.W. products —ingredients selected for their purity and uniformity.

Therapeutic notes of these outstanding products are sent to members of the Medical Profession on request.

Indian Chemical & Therapeutical Works Ltd.

68, BARRACKPORE TRUNK ROAD, CALCUTTA.

UKANE REMEDIES

THE PRODUCTS OF REPUTE AND GUARANTEE

- **UKALCIN (plain)** for all Calcium Deficiency.
  UKALCIN WITH VITAMIN B Concentrates. In Malnutritions. Tuberculosis and Haemorrhage and Anemias.
  UKALCIN WITH VITAMIN B CONCENTRATES AND VITAMIN D. Advance Therapy in Tuberculosis. Cardio-Tonic and Stimulant. Invaluable for expectant Mothers, Pernicious and Tropical Anemias.
  UKALCIN (injectable)—Calcium Gluconate 10 per cent in Sterile Pyrogen free water.
- **UKOMINT** for Coughs, Bronchitis, Colds, Asthma and Bronchial Asthma.
- **CALCIUM LACTATE WITH VITAMIN D** for Depraved Nutrition, Pregnancy, Lactation and Rickets.
- **YEAST TABLETS** Guaranteed to contain 25 international Units of Vitamin B^1.

Accepted as dependable products by the leading physicians.

For free Clinical samples and Literature apply,

Ukane Pharmaceutical & Chemical Works.

TAGORE ROAD, SANTA CRUZ, BOMBAY 25.

IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED

MEPACRINE IN MALARIA

It is not possible during war time to discuss the extensive investigations which have been carried out in various parts of the world to determine the relative merits of Mepacrine and Quinine, but the conclusions of the appropriate official bodies in Great Britain and America are that 'Mepacrine is a more effective agent than Quinine against Malaria.'

(Medical Research Council Committee on Malaria, 23rd August, 1944)

Mepacrine was first produced in Great Britain by I.C.I. in 1940, since which time hundreds of millions of tablets have been, and are being, despatched all over the world.

(Mepacrine is not yet available for distribution in India through normal Trade channels but supplies may be obtained from Government Quinine Selling Agencies.)

Issued by:—

IMPERIAL CHEMICAL INDUSTRIES (INDIA) LTD.

Calcutta — Bombay — Madras — New Delhi — Karachi

NO. 2

is prepared from exsiccated Ferrous Sulphate with traces of Copper and Manganese. Iron medication in ferrous condition is better assimilable and this action is further enhanced by the presence of Copper and Manganese in very small quantities.

Therapeutically each Feroate tablet is equivalent to 7½ grains of Blaud's Pill or 15 grains of Ferri Et Ammon Citras B. P. and affords a very convenient and effective means of administering iron.

Composition : Each tablet contains 1½ grs. of exsiccated ferrous sulphate, providing ½ gr. of iron in ferrous condition along with traces of copper and manganese.

Indications : Nutritional deficiency, impoverished condition of blood, expectant and nursing mothers.

ALEMBIC CHEMICAL WORKS COMPANY, LIMITED, BARODA

AL. 311

The Prescription for effective oral Calcium Administration.

Calcium Gluconate	7½ grs.
Calcium Glycerophos	1 gr.
Vitamin B_1	333 I.U.
Vitamin D	500 I.U.
Excipient (Flavoured)	Q.S.

CAL-DI-BI

(Tablets)

PRIMCO LIMITED

Head Office:

Lamington Chambers, Bombay 4

Branches:

Thambu Chetty Street G. T., MADRAS — 66, College Street CALCUTTA

GLASSWARES

FOR LABORATORIES

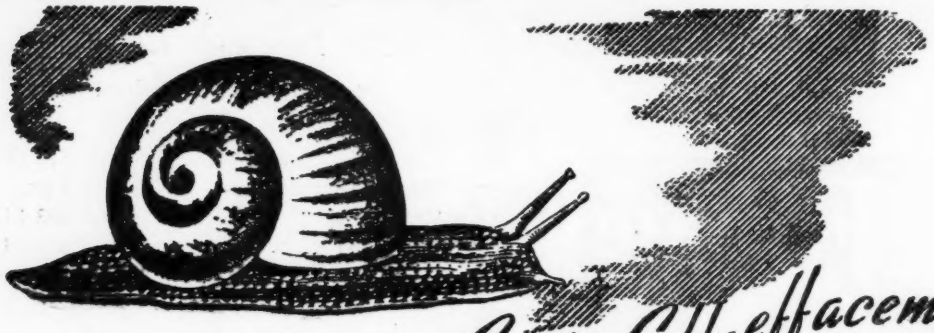
Insist on "SIGCOL" GOODS

The Complete Range you require

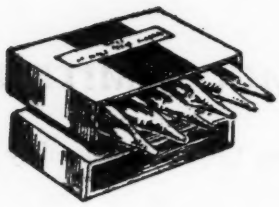
Manufactured by

SCIENTIFIC INDIAN GLASS Co., Ltd.,

6, CHURCH LANE, CALCUTTA



Snail's Self-effacement
TO REMOVE HUMAN SUFFERING



ARSO-PEPTIDE

offers the latest rational therapy in
ASTHMA AND FILARIASIS
It contains a special allergy desensitising polypeptide, derived from crustaceans, in stable organic arsenic solution.
ISSUED IN BOX OF 6×1 C.C. AMPOULES.
N. B. IT DOES NOT CONTAIN ANY VACCINE.
FOR SAMPLES AND LITERATURES WRITE TO:

UNIQUE DRUG HOUSE LTD. : 23, ISWAR MILL LANE, CALCUTTA

Announcement

UREA-STIBAMINE (According to Dr. Brahmachari's formula)—The safest and non-toxic intramuscular injection in the treatment of KALA-AZAR. TESTED BY THE REPUTED STANDARDISATION LABORATORY.

SPIROCIN—An organic Arsenic preparation specific for Syphilis. Issued with Spirocin solvent. TESTED BY THE REPUTED STANDARDISATION LABORATORY and found to be least toxic at the same time most efficacious.

Lister Antiseptics

COSSIPORE :: :: CALCUTTA

A. D. Announces

NEO-VINA—An ideal restorative tonic. Particularly for expectant and nursing mothers and also for the convalescent stage. mental fatigue and loss of vigour.—A TONIC PAR EXCELLENCE. Phials of four ounce and eight ounce.

ORANGE-VITOL—(Preparation of vitamins A, C and D). It contains vitamins A and D of Halibut Oil reinforced by the addition of Calciferol to which vitamin C of fresh Orange and Amla Juice are added. Indicated in Rickets Malnutrition and wasting diseases. Phial of six ounce.

AD

Asia Drug Co., Ltd.

DASSNAGAR :: BENGAL
City Sales Office—29, STRAND RD., CALCUTTA.

New ZANDU Product

HEPOFERRUM

a powerful Haemopoietic Tonic

Many prominent physicians are finding Zandu's HEPOFERRUM to be a thoroughly dependable and a most powerful tonic upon which they may rely for prompt, gratifying relief of the distressing Symptoms encountered in all types of Tropical Anaemias, Nutritional Setbacks, Debility and convalescence after prolonged illness.

Zandu's HEPOFERRUM produces a response which is equal to that produced by the best of this type of Haemopoietic Tonic.

Zandu's **Hepoferrum** is a superfine combination of Crude Liver Extract, Iron, Manganese, Copper, Malt Extract, Vitamin B Complex, Etc.

Product of THE ZANDU PHARMACEUTICAL WORKS LTD.

BOMBAY 14.

ALLOPATHIC AGENTS FOR BENGAL:

BOMBAY SURGICO MEDICAL AGENCY

39, Colootola Street, Calcutta.

PNEUMO-VITOL

(Lungs Tonic)

Excellent respiratory Tonic of proven merit. Each fluid ounce contains Terpine-Hydrate gr. ii, Calcium, Sodium, Potassium, Iron and Manganese Hypophosphite combined gr. v, Strychnine 1/120 gr., with Vinum Malt and Vitamin A, B, C & D.

Indicated in conditions of respiratory system after **Pneumonia, Bronchitis, Whooping cough,** during and after the disease condition **Tubercular Lungs, Rickets** and other **Marasmatic conditions of the children.**

ELIXIR-PENTA-VALERIAN

with

AURI ET ARSENII BROMIDES

It is a palatable preparation of five bromides with Valerian Gold and Arsenic.

This is most useful in nervousness, insomnia, headache, neurasthenia, hysteria, epilepsy, sexual neuroses, congestion of the uterus—vomiting of pregnancy and climacteric disturbances.

Oriental Chemical Works Limited.

8|2, Bejoy Basu Road, Calcutta.

Branch factory—Salempur—Chapra.

NUTRIGEL

Nutrient Predigested Protein in Jelly form

INDICATIONS:

A restorative food for growing children, invalids, and convalescents;

A post Typhoid and post Influenzal dietary supplement and a tonic for Tubercular patients, to combat physical exhaustion and loss in weight.

PECTIGEL

Pectin and Peptone in Jelly form

INDICATIONS:

A specific food for Summer Diarrhœa, Green Diarrhœa and Teething Diarrhœa of infants, Gastroenteritis, Chronic Colitis, Fermentative and Putrefactive Dyspepsia and Dysentery of all descriptions.

LACTIGEL

Peptonised milk in Jelly form

INDICATIONS:

A valuable diet in Gastric Ulcer, Intestinal Catarrh, for infants' use generally and in all forms of weakened digestive functions.

For further particulars, enquire of the Director:

THE SENCO LABORATORIES,

235, Rash Behari Avenue, Ballygunge.

IODO-GLUCONATE

(A well-balanced combination of Iodin 2% and Calcium Gluconate 10%)

For

TERTIARY SYPHILIS,
SCROFULOUS GLANDS,
CHRONIC RHEUMATOID ARTHRITIS,
CHRONIC BRONCHIAL ASTHMA,
STAPHYLOCOCCUS INFECTIONS.

Available in 2 c.c., 5 c.c., 10 c.c. ampoules

An effective therapy for all chronic infections and inflammatory affections.

INDIAN HEALTH INSTITUTE & LABORATORY, LTD.

5/2, Beliaghata Main Road, Calcutta

STETHESCOPE

Latest Model complete with Folding Frame, watch Shaped Chest piece and Thick Rubber Tube. **Rs. 10/8**

Chest piece only **Rs. 4/8**

For all surgical instrument please remember:—

NONGLAY MODERN VIRTUES,

Ghasmandi, Sialkot City (Pb.).

GLUKOL'S.

Special Products.

SERO CALCIN 5 c.c. & 3 c.c. (Intramuscular) With Liver extract & Vitamin B complex & C. An Ideal combination for Calcium Theraphy.

SYRUP SERO CALCIN. 6 oz. for Oral use.

PYROGEN 4 oz. A Specific for Malaria & other Tropical Fevers.

BERILIN. 4 oz. For Beri Beri & Epedemic Dropsy.

Wanted Agents & Stockists in unrepresented Areas.

GLUKOL LABORATORY LTD.,

143|1, Raja Dinendra Street, Calcutta.

PENICILLIN THERAPY IN INFECTIVE CONDITIONS OF THE EYE

Name and Composition	*Packing and Price*	*Indication*	*General Principles in Applying Penicillin*
(1) Penicillin (Strong) Penicillin 20,000 units. Fatty Vehicle to 100.	1 oz., 100 Grains Rs. 5/-	Infective conditions of the eye	Penicillin the wonder Drug discovered by Fleming and Florey is now freely available in the market. Experiments are conducted in this Laboratory with and without Sulphonamides and they are found to be effective in various Eye diseases due to infective in various Eye diseases due to infective origin. In acute Conjunctivitis, the ointment can be applied six times a day with clinical cure within 24 hours. In granular lids Penicillin Cum Sulphanilamide can be applied six times a day with a clinical cure within two weeks. Gonorrhœal Ophthalmia, Penicillin Cum Atropine is indicated and in chronic inflamations of cornea, sclera and lids, Penicillin Cum yellow oxide of mercury is indicated As a general principle, the eye should always be washed with normal saline before applying Penicillin ointment. Penicillin can also be injected in addition to local therapy in severe types of corneal ulcers, irido cyclitis etc, (ten thousand units to be injected every three hours). In Trachoma, Sulphanilamide can also be given by mouth. In G. Ophthalmia Penicillin can be injected and M & B 693 can be given by mouth. The Laboratory is ready to give further information regarding Penicillin Therapy when asked for.
(2) Penicillin Cum Sulphathiozole Penicillin 5,000 units. Sulphathiozole 5 Fatty Vehicle to 100.	1 oz. Rs. 7/8/- 100 Grains Rs. 2/8/-	Gonococcal and pneumococcal affections of the eye.	
(3) Penicillin Cum Sulphadiazine Penicillin 5,000 units. Sulphadiazine 5 Fatty Vehicle to 100.	1 oz. Rs. 7/8/- 100 Grains Rs. 2/8/-	Staphylo, Pneumo and Gonococcal affections of the eye.	
(4) Penicillin Cum Sulphanilamide Penicillin 5,000 units. Sulphanilamide 5 Fatty Vehicle to 100.	1 oz. Rs. 7/8/- 100 Grains Rs. 2/8/-	Trachoma and chronic infective conditions of the eye.	
(5) Penicillin Cum Atropine Penicillin 5,000 units. Atropine ½ Fatty Vehicle to 100.	1 oz. Rs. 7/8/- 100 Grains Rs. 2/8/-	Ulcer cornea due to infective conditions of the eye.	
(6) Penicillin Cum Yellow Oxide of Mercury. Penicillin 5,000 units. Yellow oxide of mercury 2 Fatty Vehicle to 100.	1 oz. Rs. 7/8/- 100 Grains Rs. 2/8/-	Keratitis of all forms and chronic infective conditions of the eye.	

THE SOUTH INDIAN EYE LABORATORY,
CHODAVARAM. VIZAG., (S. INDIA).

KODAK X-RAY FILM

WITH BLUE-TINTED BASE FOR EASIER VISION

SUPER-SPEED
(Clear)

TROPICAL SAFETY FILMS

SPECIALLY HARDENED - GIVE PERFECT RESULTS

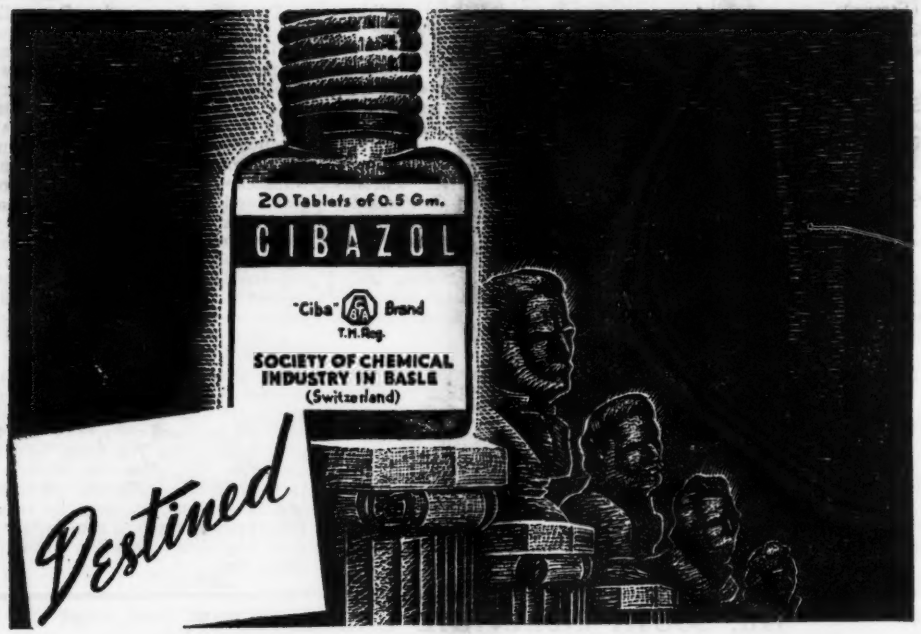
With

Kodak X-Ray
Developing and Fixing Powders

★ The Kodak Service offers individual radiographers benefits from its experience all over the world, experience covering a period as long as the existence of radiography itself

KODAK LIMITED. (Incorporated in England) BOMBAY - CALCUTTA - LAHORE - MADRAS

Printed by B. K. Sen at MODERN INDIA PRESS, 7, WELLINGTON SQUARE, CALCUTTA and published by DR. PRAKASH CHANDRA GHOSH, at Hindusthan Buildings, Room No. 23, Corporation Place, Calcutta.



FOR THE MEDICAL HALL OF FAME

CIBAZOL

(2-SULFANILYL-AMINOTHIAZOLE)

For the Specific treatment of :

PNEUMONIA, GONORRHŒA, BACILLARY DYSENTERY
STREPTOCOCCAL and STAPHYLOCOCCAL INFECTIONS
AND OTHER ALLIED INDICATIONS.

Available in Tablets for oral treatment and Powder and Ointment for local application.

Sole Importers :

CIBA (INDIA) LIMITED.
PHARMACEUTICAL DEPARTMENT
P. O. Box 479 - BOMBAY.

643